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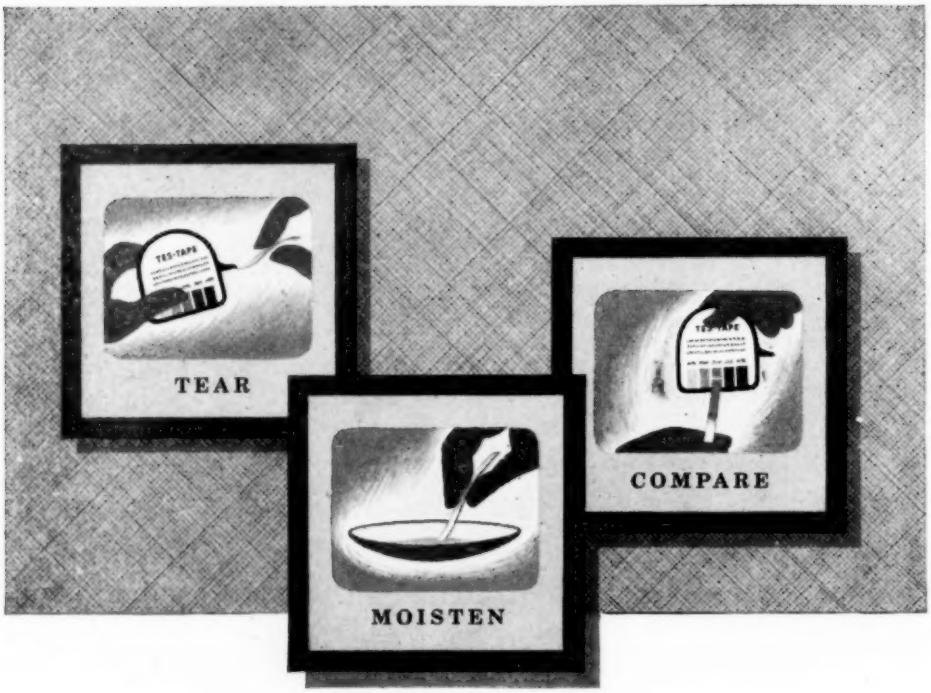

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THE TREATMENT OF TAPEWORM INFESTATION WITH DICHLOROPHEN

F. C. JACKSON M.B., B.CH.

Clinic Medical Officer, Municipality of Germiston

The City of Germiston accomodates about 1,100 adult male Natives in its municipal compound, where they are housed and fed. These Natives vary in age from 16 to 70 years, and are employed as labourers in the various municipal departments.

The presence of numerous tapeworms and roundworms has often been observed on inspections of the compound latrines, but it is practically unknown for a Native to complain of or seek treatment for worm infestation. It would appear that intestinal worms are regarded by them as commonplace and of no particular significance. Mass treatment for tapeworms had previously been suggested, but owing to difficulties from lack of a suitable vermifuge, dietetic restrictions, differing working hours, and the almost certain non-cooperation of the prospective patients, it was never seriously entertained.

2 : 2′—Dihydroxy—5 : 5′—dichlorodiphenylmethane (Dichlorophen) is known to be an effective taeniacide in dogs[1, 2] and sheep[3] and a proprietary veterinary preparation (Dicestal) has been available for some years. It is well tolerated, even in large doses. A supply of purified Dichlorophen for medical trial was made available by the manufacturers, and it was decided to use this on patients who were willing to undergo treatment. No fasting before treatment, or purgation, was involved and when this was made known volunteers were freely forthcoming, although at first there had been reluctance in trying the strange *muti*. Preference was given to those claimed to be suffering from tapeworm infestation, although it is more than probable that some claims were fictitious.

At midday on Saturday, when the labourers had ceased work for the week-end, 44 volunteers were weighed and given Dichlorophen in a dosage based on 1 × 0·5 g. tablet per 16 lb. body-weight. The tablets were consumed in a single dose on the spot, followed by a draught of water. Minimum and maximum doses were 7 and 12 tablets respectively. Patients were kept under observation until the Monday morning.

At the following week-end the trial was repeated with a further 34 volunteer patients.

The results are shown in Table I. It has never been suggested that Dichlorophen is an effective ascaricide, but the results in the treatment of tapeworm are considerd satisfactory. The weakness of the trials, of course, lies in the fact that we could not establish the previous presence of tapeworms, and the volunteers can only be considered as more or less random samples. The improvement in general health of some of the cases who voided tapeworms has been striking, particularly one young man who produced a tangled mass of tapeworms and roundworms which could scarcely be contained in a quart measure. None of these cases had reported a recurrence of tapeworms 5 months after treatment.

TABLE I. RESULTS

	1st Trial	*2nd Trial*
Total number of patients	44	34
Tapeworm voided	13	10
Tapeworm and Roundworm voided	7	4
Roundworms alone	—	—
No result	24	20

Ill effects observed are shown in Table II. The 3 slight urticarial eruptions that occurred faded in each case within 24 hours, without treatment. Abdominal discomfort reported was said to be mild and transient.

TABLE II. ILL EFFECTS

	1st Trial	*2nd Trial*
Total number of patients	44	34
Diarrhoea	8	3
Abdominal discomfort	3	4
Urticarial eruption	1	2
No ill effects	32	25

In both trials no patient failed to report for work on the Monday morning.

SUMMARY

The taeniacidal value of Dichorophen in 78 Native volunteers in a municipal compound is described.

The previous presence of tapeworm in the patients was not established, and voiding of tapeworms in 23 cases is considered a satisfactory result.

No preliminary starvation or any other preparation was required; no purgation was given.

Apart from diarrhoea and mild abdominal discomfort in a small number of patients, the only untoward effects were 3 cases of slight urticaria which faded without treatment in 24 hours. No working time was lost by any patient.

The subsequent improvement in general health of some of the patients has been striking.

I am indebted to Maybaker (S.A.) (Pty.) Ltd., for supplies of Dichlorophen.

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EDITORIAL

SURGERY IN HEREDITARY HAEMORRHAGIC STATES

Patients who have a personal or family history of an abnormal tendency to bleed are often a source of anxiety when surgery is contemplated. The patient may assert that he (or she!) is a haemophilic and may present good documentary evidence of his tendency to continue bleeding after minimal trauma. What attitude should be adopted in these instances?

It is never safe to belittle such a story. The fact that a similar story has been ignored in other patients without their coming to grief is no safeguard. On the other hand if the patient has had his haemorrhagic diathesis since birth and has undergone a major surgical procedure without severe haemorrhage he almost certainly is not a true haemophilic and it is unlikely that he will come to much harm. But, unless a careful history is taken, sooner or later a severe bleeder will be encountered on the operating table with dire consequences. Even if all laboratory tests are normal a cautious attitude should be maintained and, while surgery may be undertaken under these conditions, the surgeon should be prepared to perform an emergency blood-transfusion if it becomes necessary. The patient's blood-group must be determined beforehand and blood must be available for immediate use. Despite all modern refinements of diagnosis many bleeders still exist in whom no laboratory abnormality can be demonstrated. Indeed, they constitute the majority of bleeder patients. The patient's history of severe bleeding in the past should be credited despite the absence of laboratory confirmation. Fortunately there is not much difficulty in the diagnosis of the two important conditions—haemophilia and christmas disease.

In these two conditions surgery is especially hazardous even when the patient is one of the so-called 'mild haemophilics'.[1] In this hazardous group, too, one must include patients with circulating anticoagulants,[2] many of whom will be haemophilics. Let no one delude himself that he will always be able to stop bleeding by mechanical means. Many surgeons believe that adequate compression will always ensure haemostasis. This is not true in haemophilia. The real

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Pasiënte met 'n persoonlike of familiegeskiedenis van 'n abnormale neiging om te bloei, is dikwels 'n bron van kommer wanneer 'n operasie oorweeg word. Die pasiënt mag beweer dat hy (of sy!) 'n bloeier is en mag goeie dokumentêre bewyse voorlê van sy neiging om ná 'n geringe besering aan te hou met bloei. Watter houding behoort in hierdie gevalle aangeneem te word?

Dit is nooit veilig om so 'n storie te verkleineer nie. Die feit dat 'n soortgelyke storie by ander pasiënte verontagsaam is sonder dat hulle iets oorgekom het is geen waarborg nie. Aan die anderkant, as die pasiënt sy hemorragiese diatese van geboorte af gehad het en 'n groot operasie sonder ernstige bloeding ondergaan het, is dit amper seker dat hy nie 'n egte bloeier is nie en dit is onwaarskynlik dat hy iets sal oorkom. Maar tensy 'n sorgvuldige geskiedenis verkry word, sal daar vroeër of later 'n ernstige bloeier op die operasietafel teengekom word en die gevolge sal ontsettend wees. Al is ál die laboratoriumtoetse normaal, moet sorg deurgaans uitgeoefen word en, terwyl snykunde onder hierdie toestande onderneem mag word, behoort die snydokter gereed te wees om, indien nodig, 'n noodbloedoortapping uit te voer. Die pasiënt se bloedgroep moet vooraf bepaal word en bloed moet vir onmiddellike gebruik beskikbaar wees. Afgesien van alle moderne verfynde metodes van diagnose, is daar nog baie bloeiers in wie geen laboratorium-abnormaliteit gedemonstreer kan word nie. Inderdaad hulle vorm die meerderheid van bloeierpasiënte. Die pasiënt se geskiedenis van hewige bloeding in die verlede moet geglo word ten spyte van die afwesigheid van bevestiging deur die laboratorium. Gelukkig is dit nie baie moeilik om die twee belangrike kondisies—hemofilie en christmassiekte—te diagnoseer nie.

Snykunde by hierdie twee kondisies is veral gewaagd, al is die pasiënt een van die sogenaamde *'mild haemophilics'*.[1] By hierdie gevaarlike groep moet ook pasiënte met sirkulerende stollingsteenmiddels[2] ingesluit word. Baie van hierdie pasiënte sal bloeiers wees. Laat niemand hom self mislei nie dat hy altyd in staat sal wees om die bloeding deur meganiese middels te keer nie. Baie snydokters glo dat genoegsame druk altyd bloedstelping sal verseker. Dit geld nie in hemofilie nie. Die werklike gevaar vir 'n bloeiende hemofilie-lyer lê daarin dat spanning agter die meganiese versperring sal opbou. Druknekrose ná 'n gesnyde palm mag tot totale weefselsterfte lei, ná besnyding tot gangreen van

danger in the haemophilic who bleeds is that tension will build up behind the mechanical barrier. Pressure necrosis after a cut palm may lead to gross death of tissue; after circumcision, to gangrene of the penis, and so on. A typical example is furnished by extraction of teeth. If the socket is tightly plugged or the edges of the gum are sewn together, the bleeding may go on and the blood seep into the soft tissue around the neck and the patient may bleed to death into his tissues or suffocate. The correct treatment[3] is to plug the socket lightly (using local haemostatics if one is so inclined), apply a previously prepared dental splint, and treat the patient's haemorrhagic state by means of blood or plasma transfusion, if possible before, during and after the operation. Fresh blood or plasma is required in classical haemophilia. Stored blood or serum is preferable in christmas disease. The quantity of blood needed to fully correct the coagulation defect is very large—two or three pints may be as a drop in the ocean. Preparations of anti-haemophilic globulin (AHG) at present available in this country are for the most part inferior to fresh blood. A potent preparation prepared from bovine and porcine plasma has been produced by the Oxford workers,[4] but it is not yet generally available. It has already proved its worth.[5] Unfortunately it tends to be antigenic and has caused severe anaphylactic reactions as well as thrombocytopenia; and this may severely limit its use. For these reasons elective surgery in haemophilia must be kept to an absolute minimum, especially where the abdomen or chest needs to be opened. If any one has any doubts on the severity of bleeding which may continue despite massive transfusion let him read some of the published accounts.[6,7] Surgery is a little safer when the bleeding, if it continues, will be external. There are published accounts of gastrectomy in haemophilia,[8] and even splenectomy has been done, but there are almost certainly many unpublished cases of death after such surgery.

Operation notes in haemophilia often follow a common pattern. The surgeon is surprised at the paucity of bleeding on the operation table. Haemostasis is easily secured. Vessels are tied and do not bleed. The operating field is dry and the patient leaves the table in good condition. An hour or two later bleeding starts and is continuous. The reason for this is that there is nothing wrong with the capacity of the vessels to contract after injury. This secures haemostasis. Once the spasm relaxes, and no adequate clot has formed to take its place, bleeding starts again.

The surgeon may comfort himself with the view that most abdominal emergencies in haemophilia are caused by haemorrhage into the wall of the bowel; that the so-called acute appendix in haemophilia is most times a subserous haematoma of the caecum and will subside with conservative therapy; and even should it be a true case of acute appendicitis the mortality today with antibiotics and blood and plasma transfusion is probdie peester, ensovoorts. Die trek van tande verskaf 'n tipiese voorbeeld. As die tandholte styf toegestop word, of die kante van die tandvleis toegenaai word, mag die bloeding aanhou en in die sagte weefsel rondom die nek syfer, en die pasiënt mag in die weefsels doodbloei of verstik. Die regte behandeling[3] is om die holte liggies toe te stop (terwyl plaaslike bloedstelpmiddels aangewend word, as 'n mens daartoe geneë is), gebruik te maak van 'n vooraf bereide tandsplint, en om, indien moontlik, die pasiënt se hemorragiese toestand by wyse van bloed- of plasma-oortapping voor, gedurende of ná die operasie te behandel. Vars bloed of plasma is vir klassieke hemofilie nodig. Opgegaarde bloed of serum is verkieslik vir christmas-siekte. Die hoeveelheid bloed nodig om die stollingsgebrek volkome te bowe te kom, is baie groot—twee of drie pinte mag soveel soos 'n druppel in die oseaan wees. Preparate van anti-hemofiliese globulien (AHG) tans in ons land verkrygbaar, is meesal van minder waarde as vars bloed. 'n Sterk preparaat wat van bees- of varkplasma voorberei word, is deur Oxford-navorsers[4] vervaardig, maar dit is nog nie algemeen beskikbaar nie. Dit het alreeds sy waarde bewys.[5] Ongelukkig is dit geneig om antigenies te wees, en het dit hewige anafilaktiese reaksies sowel as trombositopenie veroorsaak; dit mag die gebruik daarvan baie beperk. Om hierdie redes moet hemofilie-gevalle wat vir snykunde gekeur word tot 'n absolute minimum beperk word, veral waar die buik of bors oopgemaak moet word. Indien enigeen die minste twyfel het oor die hewigheid van bloeding wat, tenspyte van grootskaalse oortapping, voortduur, behoort hy sommige van die gepubliseerde verslae[6,7] te lees. Snykunde is ietwat veiliger as die bloeding, indien dit aanhou, uitwendig is. Daar is gepubliseerde verslae van gastrektomie wat op hemofiliese gevalle uitgevoer en selfs splenektomie wat gedoen is, maar dit is byna seker dat baie verslae van sterfgevalle ná sulke operasies nie gepubliseer is nie.

Operasienotas by hemofilie volg dikwels 'n algemene patroon. Die chirurg is verbaas oor die geringheid van bloeding op die operasietafel. Bloedstelping word maklik verseker. Bloedvate word gebind en bloei nie. Die operasie-oppervlakte is droog en die pasiënt verlaat die tafel in 'n goeie toestand. Bloeding begin na 'n uur of twee en is aanhoudend. Die rede hiervoor is dat daar niks verkeerd is met die vermoë van die vate om na besering saam te trek nie. Dit verseker bloedstelping. Na verslapping van die sametrekking begin bloeding weer as 'n doeltreffende klont nie gevorm was nie om die plek van die sametrekking in te neem nie.

Die snydokter mag homself troos met die mening dat by hemofilie die meeste buiknoodgevalle deur bloeding in die dermwand veroorsaak word; dat die sogenaamde akute blindederm by hemofilie meestal 'n subsereuse hematoom van die blindederm is en dat dit met konserwatiewe behandeling sal sak, en al sou dit 'n egte geval van blindedermontsteking wees, is die sterftesyfer vandag, met behulp van antibiotika, bloed- en plasma-oortapping, waarskynlik nie hoër ás 10% nie, as dit so hoog is. Die sterftesyfer vir buiksnykunde by hemofiliese gevalle is waarskynlik hoër as 50%. Tensy die chirurg tevrede is dat die sterftesyfer sonder

ably not greater than 10%, if it is as much as that. Mortality of abdominal surgery in haemophilia probably exceeds 50%.[6] Unless the surgeon is satisfied that the mortality without surgery is greater than that he will be advised to let well alone.

The position is far less grim when one turns to consider the other groups of hereditary bleeding diathesis. In most of these surgery is fairly safe. As a corollary to this it is usually right to say that one may correctly operate in a case of hereditary bleeding diathesis presenting in a female. Fresh or stored blood, plasma or serum, may help to correct the bleeding state and allow the surgery to be performed. Vitamin K or Vitamin K1 may be needed if there is 'hypoprothrombinaemia', though these are only rarely of value. Fibrinogen is used for the odd case of fibrinogenopenia. It can be stated categorically that calcium plays no part in the treatment of any hereditary haemorrhagic diathesis described to date. In the absence of overt scurvy it is extremely doubtful if vitamin C is of any value. Flavinoids and adrenochromes have been disappointing. Many trade preparations exist whose names appear to indicate their ability to exert a favourable influence on blood coagulation. Their exotic names represent practically their only claim to efficacy for, almost without exception, they are worthless. Provided haemophilia and related conditions have been excluded by the sensitive thromboplastin-generation test it is usually safe to go ahead with essential (contrasted with cosmetic) surgery. The definition of 'essential' might perhaps be a little more stringent than that usually adopted.

As with other diseases, close cooperation between the pathologist, physician and surgeon is essential if the patient is to receive the best treatment at present available.

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snykunde hoër as dít is, is dit raadsaam om nie te opereer nie.

Die posisie is nie so onverbiddelik nie as die ander groepe erflike bloeiende diatese betrag word. Snykunde is betreklik veilig in die grootste gedeelte van hierdie groepe. Hiervan kan afgelei word dat dit gewoonlik korrek is om te sê dat 'n mens met reg kan opereer in 'n geval van erflike bloeiende diatese wanneer die pasiënt 'n vrou is. Vars of opgegaarde bloed, plasma of serum mag help om die bloeding te bemeester sodat die operasie uitgevoer kan word. Vitamine-K of Vitamine-K1 mag nodig wees as daar ‚hipoprotrombinemie' is, alhoewel hulle maar selde van waarde is. Fibrinogeen word vir die enkele geval van fibrinogenopenie gebruik. Dit kan kategories gestel word dat kalsium geen deel het nie in die behandeling van enige erflike hemorragiese diatese wat tot op datum beskryf is. As skeurbuik nie definitief aanwesig is nie, is dit hoogs twyfelagtig of Vitamine-C van enige waarde is. Flavinoïede en andrenochrome was teleurstellend gewees. Daar bestaan baie handelspreparate die name waarvan skynbaar hulle vermoë aantoon om 'n gunstige invloed op bloedstolling uit te oefen. Hulle eksotiese name verteenwoordig feitlik hulle enigste aanspraak op doeltreffenheid, omdat hulle amper sonder uitsondering, waardeloos is. Mits hemofilie en verwante kondisies deur die sensitiewe tromboplastien-generasietoets uitgesluit is, is dit gewoonlik veilig om met essensieële (in teenstelling met kosmetiese) snykunde voort te gaan. Die definisie van ‚essensieële' behoort miskien ietwat strenger te wees as wat gewoonlik aanvaar word.

Soos met ander siektes, is noue samewerking tussen die patoloog, internis en snydokter noodsaaklik sodat die pasiënt die beste behandeling wat vandag beskikbaar is, kan ontvang.

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STERILIZED MILK AND MILK DRINKS

Two years ago Dr. J. A. Richter called attention at the South African Medical Congress to the introduction at Port Elizabeth of the production and marketing of sterilized milk; and the publication of Dr. Richter's[1] paper was accompanied by editorial comment[2] in this *Journal*. It is now generally accepted that milk supplies ought to be safeguarded by heat treatment to remove the potential threat of milk-borne disease, which dairy control has not otherwise succeeded in eliminating. Heat treatment is compulsory in certain parts of the world but in South Africa only in Cape Town, and much raw milk is still consumed in this country.

The prevailing method of heat treatment is pasteurization at as low a temperature as will in the time of operation kill the infection of ordinary milk-borne diseases. The extent to which pasteurization prolongs the time the milk can be 'kept' is very limited. Milk sterilization, which is carried out at a much higher temperature, in crown-corked bottles, kills all the germs in the milk so that it can be kept for practically an indefinite time without refrigeration.

The 'keeping' qualities of unopened bottles of sterilized milk are extremely convenient for the sale of milk over the counter, and for households that are not

equipped with refrigerators and, although pasteurization is still the process of choice for most purposes, sterilization has an important field of its own. Indeed Dr. Richter said in her paper that with one year's production of sterilized milk the consumption of milk in Port Elizabeth had increased by 10% at least. It has recently been stated that now that sterilized milk has been on sale there for 3 years 35% of all the milk sold in Port Elizabeth is consumed as sterilized milk.

One form of sterilized milk of considerable health interest is the flavoured milk-drink resembling a 'milk-shake'. Drinks, of course, will stand on their own merits as beverages, not as foods, and the various 'cool drinks' on the market will always appeal to a section, at all ages, of those who prefer them to cold water. But the fact remains that a great deal of money is spent on 'cool drinks' by people who would be better advised to buy something nutritious; and for these people milk drinks, not necessarily made with 'whole' milk, offer the advantage of being pleasing to the eye and the palate and at the same time a really valuable addition to the diet.

It has now been announced that a new factory has been completed in Johannesburg for the production of sterilized whole milk and sterilized flavoured milk as well as pasteurized milk.

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INFECTIOUS MONONUCLEOSIS IN BANTU CHILDREN

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Infectious mononucleosis is defined by Tidy[1,2,3] as an acute infectious disease characterized by the enlargement of lymphatic glands, changes in the blood cells, particularly mononucleosis, the presence of heterophile antibodies in the serum, and a uniformly favourable course.

The disease was first described by Pfeiffer in 1889, but it was not until 1922 that a case was reported in a Negro patient, by Longcope.[4] No further Negro cases were reported for 20 years and, although Bernstein[5] reviewed 65 cases at the Johns Hopkins Hospital in 1940, all were in White people. A year later, however, Werlin *et al.*[6] reported 4 serologically proved cases in Negro adults; since then, there have been numerous reports of Negro cases in the literature—[7,8,9,10,11,12,13,14] and most workers are now of the opinion that infectious mononucleosis is not as rare in the Negro as had hitherto been believed. Despite this, relatively few cases have been shown to occur in Negro infants and children.

The first reported cases of the disease in Negro children were those of Johnson[7] in 1944. One year later Blain and Von der Heide[9] described a further case in a boy of 6 years. In 1949 Bower *et al.*[10] described a case. Chernoff and Josephson,[15] in 1951, reported a case associated with acute erythroblastopenia, and Harley,[16] reviewing 15 cases, found 9 in Negro children, the youngest of whom was 9 months. In the same year Walker[17] described a case in an infant of 9 weeks. Finally, in 1952, Karpinski[18] was the first to describe a case of infectious mononucleosis in a Negro child who developed neurological manifestations. A review of the available literature thus reveals only 16 cases of infectious mononucleosis in Negro infants and children. We were unable to find any proven cases reported in Bantu children in Southern Africa.

We have reviewed the admissions to the Paediatric Department of Coronation Hospital, Johannesburg, over the past 6 years and have been unable to trace any proven cases of infectious mononucleosis during the 4 years 1950-1953; while in the 2½ years commencing 1954 we have been able to confirm 4 cases, which we present here.

CASE REPORTS

Case 1

J.D N., 1-year-old male Bantu child, was admitted to the Paediatric Ward on 22 September 1955 with a history of cough for 2 days, pyrexia for 1 day, and restlessness. Three weeks previously the child had spent 4 days in hospital with gastro-enteritis and dehydration, requiring intravenous therapy.

The child was obviously ill, coughing and dyspnoeic. The temperature was 105° F, pulse 160 per minute, and respirations 50 per minute. The throat was slightly injected. Submandibular, tonsillar and cervical lymph-nodes were palpable, but not tender. Signs of consolidation were present at the left base and right apex. The cardio-vascular and central nervous systems were normal. Liver and spleen were not palpable. There was no cyanosis, oedema or pigmentation of the extremities. A diagnosis of pneumonia was made and treatment instituted, viz., penicillin, 250,000 units 6-hourly, and streptomycin, ½ g. twice daily.

Progress and Investigations. On the 2nd hospital day, the temperature had fallen to 100° F. Full blood-count showed haemoglobin 7·2 g.% and leucocytes 15,600 per c.mm. (neutrophils 43%, monocytes 3%, lymphocytes 54%). There was a marked hypochromic anaemia. X-ray examination of the chest showed patchy consolidation involving the lingular segment of the left upper lobe, the left base, and the right apex. Hilar adenopathy was present.

On the 3rd hospital day, the temperature rose to 103° F with no change in the physical signs but, by the 5th day, the temperature had fallen to normal and remained so for the rest of the stay in hospital. The modified Ide, patch and Mantoux tests were negative. The liver and spleen were now palpable. Two days later the heterophile antibody titre was 1/112 and the differential absorption tests were positive for glandular fever.

A blood transfusion of 275 c.c. was given on the 9th day. On

the 12th hospital day the haemoglobin was 13·5 g.% and leucocytes 15,700 per c.mm. (neutrophils 40%, monocytes 3%, lymphocytes 57%). Atypical lymphocytes were present. Liver function tests were as follows: Thymol turbidity 4 units, thymol flocculation ++++, colloidal red ++, Takata Ara reaction negative, zinc-sulphate turbidity 17·8 units, alkaline phosphatase 9·4 King-Armstrong units, total serum-bilirubin 1·0 mg.%, and serum-proteins 7·2 g.% (albumin 4·0, globulin 3·2.)

On the 15th hospital day the spleen was no longer palpable, but the liver was still enlarged and the neck glands were still present. X-ray examination of the chest showed clearing of the right apex and partial clearing of the left base. By the 20th day the blood count had returned to normal, and the heterophile antibody titre had now risen to 1/224 with positive absorption tests for glandular fever. On the 33rd day small palpable neck glands were still present, but the liver was no longer palpable. Clinically, and on X-ray examination, the chest was clear and the patient was discharged.

Case 2

J.R., 10-month-old male Bantu infant, was admitted to hospital on 31 August 1955 with a history of a bulging fontanelle for 4 days. There had been no pyrexia, vomiting or diarrhoea.

The infant was in apparent good health. The temperature was 98° F, pulse rate 130 per minute, and respirations 28 per minute. Signs of rickets were present, viz. cranio-tabes, rickety rosary and enlarged wrist-joint epiphyses. Ears, nose and throat were normal. The anterior fontanelle was large, firm and bulging. There was no neck stiffness and Kernig's sign was negative. Respiratory and cardio-vascular systems were normal. The cranial nerves were intact. Fundi were normal. The motor system showed no abnormality and muscle tone was normal. There was no interference with sensation. Reflexes were normal and equal. The liver and spleen were both palpable 2 fingers below the costal margins. The rest of the examination was normal.

Progress and Investigations. Lumbar puncture showed the cerebrospinal fluid to be under pressure of 300 mm. of water, and the fluid was found to contain 1 lymphocyte per c.mm. and protein 16 mg.%. On the 2nd hospital day, full blood-count showed haemoglobin 10·5 g.% and leucocytes 10,000 per c.mm. (neutrophils 31%, monocytes 4%, lymphocytes 62%, eosinophils 1%, basophils 1%). Some atypical lymphocytes were seen. The heterophile antibody titre was positive 1/112, confirmed by differential absorption tests. Viral and ricketsial complement-fixation tests were negative. The typhoid, paratyphoid, brucella and proteus agglutination tests were negative. X-ray examination of the chest and skull was normal. By the 4th hospital day, the fontanelle was normal.

On the 7th hospital day, haemoglobin was 10·7 g.% and leucocytes 8,300 per c.mm. (neutrophils 34%, monocytes 10%, lymphocytes 51%, atypical lymphocytes 5%). The heterophile antibody titre was 1/56. Lymph glands were now palpable in the axillae and neck. On the 10th day, a Mantoux test was negative. Liver function tests were as follows: Thymol turbidity 3 units, thymol flocculation negative, colloidal red ++, Takata-Ara reaction negative. zinc-sulphate turbidity 12·4 units, alkaline phosphatase 69·6 King-Armstrong units, total serum-bilirubin 0·5 mgm.%, and serum-proteins 6·1 gm.% (albumin 3·3, globulin 2·8).

On the 14th hospital day, the spleen, liver and axillary, neck and inguinal glands were just palpable. The patient was discharged the following day.

Case 3

T.K., a 2-month-old Bantu male child, was admitted on 31 January 1956 with a history of diarrhoea and vomiting for 2 weeks. The child was grossly dehydrated and acidotic. The temperature was 100° F, pulse rate 124 per minute, and respiration 30 per minute. A few small glands were palpable on both sides of the neck. The respiratory, cardio-vascular and central nervous systems were normal. The liver and spleen were not palpable. Intravenous fluid therapy was instituted, the child rehydrated and the acidosis corrected.

By the 3rd hospital day, the temperature had fallen to normal, where it remained for the rest of the patient's stay in hospital. On the 4th day, a full blood-count showed the haemoglobin to be 11·5 g.% and leucocytes 10,200 per c.mm. The heterophile antibody titre was positive 1/112, and was confirmed by differential absorption tests.

On the 11th day, leucocytes were 10,000 per c.mm. (neutrophils 53%, monocytes 3%, lymphocytes 44%). The heterophile antibody titre was now 1/224, and was confirmed by the differential absorption tests. Liver function tests were as follows:thymol turbidity 10 units, thymol flocculation ++++, Takata-Ara reaction negative, zinc-sulphate turbidity 11·4 units, colloidal red ++++, alkaline phosphatase 23·8 King-Armstrong units, total serum-bilirubin 0·5 mg.% and serum-protein 7·0 g.% (albumin 3·1, globulin 3·9). By the 23rd hospital day, the lymph glands in the neck were no longer palpable and 2 days later, the child was discharged clinically well.

Case 4

D.B., a 5-year-old Bantu female child, was admitted to hospital on 1 July 1954 with a history of progressive swelling of the abdomen for 4 months. Temperature 99·2° F, pulse rate 130 per minute and respiration 26 per minute. Axillary, inguinal and epitrochlear glands palpable but not tender. The abdomen was distended, and the liver and spleen were palpable 4 and 6 fingers, respectively, below the costal margin. The cardio-vascular, respiratory and central nervous systems were normal.

Progress and Investigations. On the 2nd hospital day, the haemoglobin was 10·6 g.%, and leucocytes 7,800 per c.mm. (neutrophils 51%, monocytes 1%, lymphocytes 43%, eosinophils 3%, basophils 2%). Malarial parasites were not observed, and the bilharzial complement-fixation test was negative. Examination of the urine and stools revealed nothing abnormal. Liver function tests were as follows: thymol turbidity 9·0 units, thymol flocculation ++++, colloidal red +++, Takata-Ara ++, zinc turbidity 47·4 units, alkaline phosphatase 17·5 King-Armstrong units, total serum-bilirubin 0·4 mg.%, and serum-protein 8·2 g.% (albumin 3·2, globulin 5·0).

On the 20th hospital day, the spleen was smaller, but the left inguinal glands had increased in size. On the 23rd day, the heterophile antibody test was positive 1/112, and was confirmed by the differential absorption tests. On the 31st day, the heterophile antibody titre was again positive 1/112 and confirmed by the differential absorption tests. On the 42nd day, leucocytes were 15,800 per c.mm. (neutrophils 34%, monocytes 4%, lymphocytes 49%, atypical lymphocytes 13%).

The patient was discharged on the 49th hospital day. At that stage the liver and spleen were still palpable and the axillary, inguinal and epitrochlear glands were still enlarged.

DISCUSSION

Infectious mononucleosis, although recognized as a disease entity for over 60 years, has up to the present been reported in relatively few Negro infants and children. The occurrence of the disease does not appear to be limited by factors of geography or race; indeed, it is world-wide in distribution.[1,25] There is no known reason why the disease should not affect Negro infants and children just as commonly as Whites, and it may probably be that many cases are not diagnosed because the disease has an exceptionally low mortality and only a moderate morbidity.

Although the diagnosis of infectious mononucleosis may easily be overlooked because of its relatively benign course in the large majority of cases, it has become increasingly apparent that this disease is not necessarily always such a benign and self-limited one. On the contrary, evidence has accumulated in the past few years to indicate that the disease process is a systemic one, its clinical manifestations being dependent upon the system or systems involved. Instances of hepatitis,[5,20,21,22,23] myocarditis,[5,14] pneumonitis,[5] encephalitis,[5,18] and interstitial nephritis,[5] resulting from infectious mononucleosis have been reasonably well documented. In an excellent review of the literature

in 1952 Karpinski[18] points out that changes in the central nervous system in children caused by infectious mononucleosis are far more common than one is generally aware of, and that this disease should always be considered in the differential diagnosis of the numerous 'idiopathic' encephalitides and meningitides seen in paediatric practice.

Diagnostic Criteria

The criteria for diagnosing infectious mononucleosis in our 4 cases presented above were based upon the following five points:

1. *Lymphadenopathy.* Enlargement of one or other group of lymph nodes, or generalized glandular enlargement, is usually a constant finding in cases of infectious mononucleosis.[5,26] In a minority of cases, however, glandular enlargement may be absent in spite of a positive serological test.[27]

2. *Hepatomegaly and Splenomegaly.* Splenomegaly is a common feature in infectious mononucleosis and, according to Bernstein,[5] occurs in 50% of cases. Hepatomegaly, however, occurs less frequently (24%) despite the fact that hepatitis is frequently present.

3. *Mononucleosis and Atypical Lymphocytes.* There is no blood picture that is exclusively typical of infectious mononucleosis;[3,5] however, a mononucleosis appears at some stage of the disease[5] and, associated with this, is the appearance of atypical mononuclear cells which, although not diagnostic of the disease, is highly suggestive.[3]

4. *Positive Heterophile Antibody Reaction.* In 1932 Paul and Bunnell[28] discovered antibodies that could react with certain antigens which were different from, and phylogenetically unrelated to, those instrumental in producing the antibody response. These heterophile antibodies, as they are called, are present in low titre in normal serum but have been shown to occur in high titre in the serum of patients suffering from infectious mononucleosis.[3,28,29] The differential absorption test is a confirmatory test for infectious mononucleosis, the agglutinins in the serum of cases of that disease[30,31] being absorbed by boiled beef cells and not by guinea-pig kidney. A titre of 1/56, when accompanied by positive absorption-tests, is regarded as being absolute diagnostic evidence of infectious mononucleosis.[3,30,31]

5. *Abnormal Liver Function Tests.* Hepatitis, not necessarily accompanied by jaundice or hepatomegaly, has been shown to occur in infectious mononucleosis by many workers.[20,21,22,32,33] Brown *et al.*[23] and Gall[33] have suggested that all cases of infectious mononucleosis will show some degree of liver damage, and that hepatic involvement is a usual, rather than an incidental, occurrence. Leibowitz and Brody[20] question the validity of the diagnosis in the absence of liver damage.

Review of Presenting Signs and Symptoms

After a study of the 16 cases so far reported in Negro infants and children, and our own 4 Bantu cases, we feel that it may be of some interest to review briefly and analyse the modes of presentation and the physical findings with which the cases presented.

Of our 4 cases, 1 presented with respiratory distress and pneumonia, 1 as an acute diarrhoea and vomiting and dehydration, 1 with a bulging fontanelle, and 1 with generalized lymphadenopathy and hepatosplenomegaly for investigation. All 4 cases showed lymphadenopathy on admission to hospital or developed palpable lymph-nodes within the first week of their illness. Hepatomegaly and splenomegaly were present in 3 of our cases, and atypical mononuclear cells were found to be present in the same 3 cases. In every case the heterophile antibody reaction showed diagnostic titres of 1/112 or higher with positive differential absorption tests. Abnormal liver function tests were present in all 4 cases, indicating the presence of hepatic damage despite the absence of jaundice. The age incidence ranged from 2 months to 5 years.

Of the 9 cases reported by Harley,[16] 6 presented with membranous tonsillitis and were admitted to hospital in order to exclude diphtheria. Of the other 3 cases, all had generalized lymphadenopathy as the major presenting symptom and were investigated to rule out tuberculosis or leukaemia; one of them had a maculo-papular rash resembling measles. The age incidence of these 9 cases ranged from 9 months to 7 years.

Of the remaining 7 reported cases, most of the children were severely ill on admission, many of them having temperatures between 101°F and 105°F. The youngest of the 7 was 9 weeks old and presented with acute diarrhoea and vomiting.[17] The other 6 cases ranged in age from 5 months to 10 years. Five of them presented with acute membranous tonsillitis (making a total of 11 cases with this symptom) and were severely ill children. Two presented with signs of involvement of the central nervous system—1 with headache and fever and 1 with drowsiness and irritability. The latter was found to have 297 mononuclear cells per c.mm. in the cerebrospinal fluid, recovery taking place after 1 week.[18] One child presented with respiratory distress.[19] Four of these 7 children had enlarged palpable spleens with generalized lymphadenopathy, and 2 had enlarged livers.

CONCLUSION

From the foregoing it will be seen that by far the commonest presenting symptom in the 16 reviewed cases reported by other authors was an acute membranous tonsillitis, in most cases accompanied by a generalized lymphadenopathy and splenomegaly. None of our cases presented thus, their clinical picture being somewhat atypical and differing from the generally accepted modes of presentation as described by Tidy.[1,2,3] It would appear, therefore, that infectious mononucleosis may present in a variety of ways and is protean in its manifestations. It is for this reason that cases of this disease may be easily overlooked. Although there were no deaths in these cases, it should be noted that many of the children went through a stage of high fever and were severely ill. Central-nervous-system signs were present in 10% of the total cases reported so far, acute diarrhoea and vomiting in 10%, and respiratory distress in 10%. Splenomegaly was present in 35% of cases and hepatomegaly in 25%.

We are of the opinion that mild cases of infectious mononucleosis are not uncommon among Bantu infants and children, and that, were this condition looked for a little more carefully, the incidence would probably equal that in any other race. Although the disease is benign in the majority of cases, it is important to bear in mind that the more severe manifestations of the disease are by no means rare.

SUMMARY

1. A review of the literature on the incidence of infectious mononucleosis in the Negro, with particular reference to its occurrence in Negro infants and children, is presented.

2. Four cases of infectious mononucleosis in Bantu infants and children at Coronation Hospital, Johannesburg, are described.

3. The presenting symptoms and signs in the 20 reported cases of infectious mononucleosis in Negro infants and children are briefly reviewed and analysed.

4. It is our opinion that infectious mononucleosis in Bantu infants and children is not as uncommon as has hitherto been believed.

5. The disease may present in a variety of ways and is protean in its manifestations.

6. Although the disease is benign in the majority of cases, more severe manifestations are by no means rare.

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ANAESTHETIC EXPLOSIONS

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The flammability and explosibility of many of the more useful anaesthetic agents are properties regarded with apprehension by a large number of anaesthetists and surgeons. Indeed, because of these properties, such an excellent anaesthetic agent as di-ethyl ether may become surrounded by as many taboos as the wooden image worshipped by a savage African tribe. The drama of fire and explosion in the operating theatre is greater than that surrounding an atomic explosion, but the reason for this is that atomic explosions are more frequent and so less wondered at.

FREQUENCY

In 1930 the Committee on Anaesthesia Accidents of the American Medical Association[1] stated that 'explosion is statistically (today) the least of the hazards of anesthesia' and in 1955 the British Ministry of Health[2] reported that 'the risk of an explosion during an operation is of the order of 1 in 485,870'. This latter figure is for all types of anaesthetic agent, flammable and non-flammable. In 1939 Woodbridge[3] reported that of a total of 2¼ million anaesthetics in which ether, cyclopropane or ethylene were used (i.e. all flammable agents) 49 were accompanied by explosion or fire and these 49 accidents resulted in 2 deaths and in injuries to 7 other people. The risk of a fire or explosion during the use of one of these agents is therefore between 2 and 4 per 100,000 anaesthetics, and the chance of dying from an anaesthetic explosion is far less than 1 in 1,000,000. If these figures for flammable agents are equated with the figures of the British Ministry of Health for all agents, including non-flammable agents, then in every 7½ million anaesthetics there will be one death from an anaesthetic explosion.

In contrast, in a review of a total of 1,050,422 anaesthetic administrations (Table I) it is found that 674 deaths were due directly or indirectly to the anaesthetic —an incidence of 1 death per 1,556 anaesthetics. Not

TABLE I

Source	No. of Anaesthetics	No. of Deaths
Beecher and Todd[4]	599,548	384
Meyer Saklad[5]	388,203	205
Wylie and Kee[6]	11,000	21
Groote Schuur Hospital[8,9,10] ..	51,671	64
	1,050,422	674

one of these deaths was reported as due to an anaesthetic explosion. But from the same sources we find that in a series of 55,090 patients receiving an anaesthetic (Table II) 84 died as a result of hypoxia or anoxia due to the anaesthetic technique (i.e. deaths from haemorrhage or shock of *surgical* origin are excluded). Expressed in a slightly different form, in a highly selected series,

TABLE II

Source	No. of Anaesthetics	No. of 'Anoxic' Deaths
*Beecher and Todd[4]	44,090	74
Wylie and Kee[6]	11,000	10
	55,090	84

including a very large (85%) proportion of patients receiving 'curare', there was one anoxic death per 656 anaesthetics. Thus we see that every year a completely negligible number of people are killed by anaesthetic explosions while a great number are being killed by oxygen deprivation. The first manner of death is loudly noisy and cannot be concealed, while the second is darkly secret. With the second, everybody is surprized at the patient's demise and ascribes it to enlarged thymus, myocardial infarction, shock, magic, or plain 'cussedness' on the part of the patient. The cause of death is frequently certified as being due to 'reflex cardiac asystole'—a mysteriously magical entity.

CAUSATION

An analysis of any series of anaesthetic explosions quickly reveals the fact that almost invariably the explosion is due to neglect of elementary precautions. This neglect, in turn, is usually born of ignorance and often sired by sloth. The anaesthetists who suffer these 'visitations of misfortune' are of the type who, while the petrol tanks of their motor cars are being filled, blithely light a cigarette and toss the match out of the car window without first extinguishing it. Lady Luck is not always with them.

An explosion is usually the result of a rapid chemical reaction which liberates large volumes of gas into a confined space. These volumes of gas rapidly increase the pressure in the confining vessel, which bursts. The sudden shock-waves, the flying splinters of the burst vessel, and the fire which is frequently started by the heat evolved in the chemical reaction, are responsible for whatever other damage may result.

Certain conditions must be satisfied before the chemical reaction can take place. Firstly the chemicals which are to take part in the reaction must be in physical contiguity. This requirement extends to the level of molecular existence. As an example, in mixtures of ether vapour and air, the ether molecules are widely separated from the oxygen molecules, with which they would unite, by interspersed nitrogen molecules, which are chemically inert. The ether and oxygen molecules in mixtures of ether vapour and oxygen are jostled together and are much more closely related than in ether-air mixtures. In either mixture, if the mixture is under increased pressure the molecules are more closely packed, while if the mixture is under decreased pressure they are more widely separated. The closer the physical contiguity of the potentially reactive molecules, the more likely is a reaction to occur if the remaining conditions are also satisfied.

The second condition which must be satisfied is the spark to fire the powder train. Energy, usually in the form of heat, must be supplied to initiate the chemical reaction and, as in the all-or-none law in physiology, the energy quantum must exceed a certain threshold value. Even given an energy quantum of sufficient value, reaction will not necessarily be initiated, because the nature of the molecules in the vicinity of the energy quantum, as well as their proximity to the energy quantum and to each other (see the first condition above) will influence the course of events.

Gases, like liquids and solids, have specific heat properties, and it is of course the molecule itself which absorbs the heat (or energy). If the molecules in the vicinity of the energy quantum have an increased capacity for absorbing heat they will absorb and dissipate the energy supplied, in addition to separating the reactive molecules, so that the chemical reaction will not be initiated.[7] Hence the nature of the mixture containing the reacting agents, and the physical conditions under which it exists, play an all-important part in the subsequent course of events when a quantum of energy (ignition source) is added to the mixture.

As an example of the importance of the physical conditions present during anaesthesia, consider the administration of ether by the open-drop method to a patient in a room which measures 15 feet long by 10 feet wide and 10 feet high. There will be 1,500 cubic feet of air in this room. To provide 1·5% of ether vapour in the air in this room (1·5% of ether in air is the weakest ether-air mixture which can be exploded) 22·5 cubic feet of ether vapour must be added. This volume of ether vapour will be provided by vaporizing 4·6 lb. of liquid ether. It is very rare to use much more than ½ lb. of liquid ether during an ordinary open-drop ether anaesthetic; moreover we are postulating in our example that there is no ventilation in the room to dilute and refresh the air.

In 1930 Yandall Henderson,[1] using mixtures of 80% ethylene (a highly explosive hydrocarbon anaesthetic gas) and 20% oxygen for clinical anaesthesia found that only minute amounts of ethylene could be

* All these anaesthetics included the use of muscle relaxants ('curare').

detected a few feet away from the anaesthetic apparatus. Even in the neighbourhood of the anaesthetic facepiece, ignitable concentrations of ethylene were not found except within a distance of less than 12 inches in the direct line of the expiratory valve. Ether vapour, under the same conditions, diffused less readily, so that concentrations above the mask were negligible and concentrations below the level of the mask tended to be greater, at the same distances, than the corresponding relative concentrations of ethylene.

These examples show very well the value of diluting explosive gas-mixtures with inert gases, the handiest being air. They emphasize the value of adequate ventilation and remind us that before using the cautery or diathermy in any body-cavity it is an excellent principle to aspirate the air from that cavity. This will ventilate the cavity, removing old gas which may contain ignitable traces of anaesthetic, and drawing in fresh air.

CASE REPORT

An elderly male was receiving an anaesthetic for the excision of a malignant growth in the mouth. The anaesthetic was nitrous oxide, oxygen and ether, delivered through a plastic endotracheal tube directly into his trachea. The pharynx was packed with moistened gauze. The surgeon unexpectedly announced that he would need to use the electric cautery; so the anaesthetist turned off the ether vapourizer *but did not remove the vapourizer from the anaesthetic machine*. After waiting for 3 minutes he announced that the cautery could now be safely used. As the surgeon began to cauterize within the mouth there was sharp explosion and the operating theatre was filled with flying glass and with flaming liquid ether from the shattered ether vapourizer. The corrugated rubber tubing was torn from its connections to the endotracheal tube and the anaesthetic machine and was hurled across the room. The reservoir gas bag was fragmented but the corrugated rubber tubing was undamaged (see Figs. 1 and 2). The patient was unharmed and so were surgeon and anaesthetist. The fire was rapidly extinguished (it is always a wise precaution to acquaint oneself with the siting of fire extinguishers in the places where one works) and the anaesthetic was continued with a different anaesthetic machine. The operation was concluded successfully.

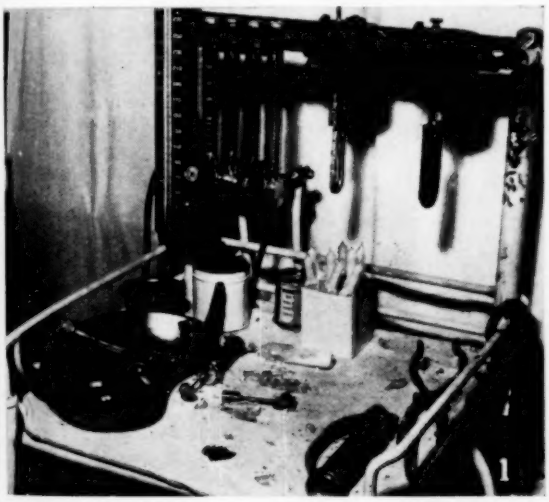

Fig. 1. The Boyle's anaesthetic machine immediately after the explosion.

Fig. 2. The shattered remnants of the reservoir bag and the ether and trilene vaporizer bottles. The corrugated rubber tube is undamaged.

DISCUSSION

In reconstructing the event it was pointed out that the fact that an ether vapourizer is switched to the *Off* position is no guarantee that it is not still allowing small amounts of ether vapour to leak into the anaesthetic gases that are being delivered by the machine. It was apparent that the cautery had ignited the patient's inspiratory dead-space gas as he was about to exhale. The flame did not flash down into the patient's lungs because his tracheal and alveolar air contained a relatively high concentration of carbon dioxide and of water vapour, both inert diluent gases. But the flame did flash back along the anaesthetic gases in the corrugated rubber tubing, where there was relatively no water vapour or carbon dioxide but where there was sufficient ether vapour to propagate a flame. The fact that the ether vapourizer, although apparently isolated from the anaesthetic circuit, did explode, can only mean that it was not properly isolated. There was in fact a physical leak by means of which ether vapour could reach the anaesthetic gases and the flame could enter the vapourizer. In the confined space of the vapourizer the chemical reaction resulted in an explosion.

The accident could have been avoided by removing the ether vapourizer from the anaesthetic machine when it was known that the diathermy was to be used. As an additional precaution the mouth should have been ventilated by sucking out the air in that cavity and thus filling it with fresh air.

To prevent all deaths from anaesthetic explosions, it is necessary never to use a flammable anaesthetic agent. However by the very nature of the phenomenon of anaesthesia, there is *no* agent or method which does not carry a risk of permanent injury or of death, either from the inherent toxicity of the drugs used or from associated accidents. Accidents can never be completely eliminated in the practice of an art in which human judgment plays such a very large part.

By extension of the argument no anaesthetic should

ever be administered to any patient because of the risk that the anaesthetic agent or the technique may be responsible for the death of the patient. This risk is 4,000 times greater than the risk of death from an anaesthetic explosion. A nicely calculated balancing of the risks involved in any anaesthetic should determine the choice of agent and technique, but the weight of available evidence suggests that those who will never use a flammable anaesthetic agent are deterred, not so much by the thought of what might happen to the patient, but by the thought of what might happen to themselves.

For those who feel that the elementary precautions to be observed in the use of flammable anaesthetic agents, which can be deduced from the discussion in this article, constitute insufficient protection, it is now possible to acquire a piece of apparatus known as an 'Explosimeter'.* This apparatus will indicate quickly and accurately whether a small gas-sample presented to it is capable of being ignited or exploded. With this apparatus it is possible, at any time, to monitor the anaesthetic atmosphere being inhaled by the patient.

* For example, that produced by Messrs. Mines Safety Appliances.

SUMMARY

The risk of death from an explosion during any anaesthetic is of the order of 1 in 7½ million while the risk of death from the anaesthetic itself is greater than 1 in 2,000.

The conditions required for explosion of anaesthetic atmospheres are discussed and a case is presented to emphasize that explosions are usually the result of failure to observe simple precautions.

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MEPHENESIN CARBAMATE IN THE TREATMENT OF SPASTIC PARALYSIS

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Mephenesin was introduced in 1951 as a muscle relaxant. It was found to act mainly on the spinal cord, but also on the basal ganglia and the brain stem. Favourable comments on its action have been published in cases of rheumatoid arthritis, fibrositis, spastic paralysis, disseminated sclerosis, and other conditions.

Since 1954 mephenesin (Tolserol, Squibb) has been replaced by mephenesin carbamate (Tolseram) as being more efficacious and less toxic. Reports of its value have appeared from Engler[1,2] in severe spastic disorders present from birth, from Larkin[3] in fibrositis, and from Marshall[4] in disseminated sclerosis. On the other hand Fasser[5] has stated that 'Tolserol and other related drugs have been found to possess no value or very little indeed' in cerebral palsy.

It was therefore decided to test its efficacy on 10 spastic patients in this Institution. All are certified mental defectives of various grades, and all suffer from severe spastic disorders of various types.

Dosage. The drug is available as 0·5 g. tablets and was administered in a little milk immediately after meals. In adults the initial daily (divided) dose was 6 g., and this dosage was maintained for 4 weeks if the patient responded. Where no response was obtained the daily dose was raised to 9 g. In children the initial dose was 1·5-3 g. daily, according to age, which was increased to 4·5 g. and later to 6 g. where no initial response was obtained. Where no response was obtained at the end of 3 weeks treatment was stopped. In the other cases tailing off was begun at the end of the 4th week, when the dosage was halved. The following week it was halved again, and this reduction continued until adults were getting 1 g. per day and children 0·5 g. per day as maintenance doses.

Side-effects. These were mild and transient. One patient vomited, two showed drowsiness, one showed marked pallor, and one had a sense of weakness and loss of power in the spastic limbs. One patient complained of pains in the affected muscle-groups, and another of giddiness of short duration shortly after swallowing his tablets. Two patients showed a marked increase in appetite during treatment. In no case did

treatment have to be suspended because of undesirable side-effects.

PATIENTS

The patients were selected entirely on the basis of suffering from severe forms of spastic paralysis without taking into account the cause of the paralysis. Their spasticity was due to such varied conditions as cerebral palsy, localized upper-motor-neurone lesions, and encephalitis. Their mental states varied from idiocy to high-grade feeblemindedness.

All patients were given a careful neurological examination before treatment was begun, and were re-examined at weekly intervals during the period of treatment. One of the difficulties encountered was the assessment of the amount of spasticity present. Engler[2] measured the range of movement in the joints of his patients before treatment, and was thus able to record any subsequent improvement. After consultation with an orthopaedic surgeon and a physiotherapist we decided that there was no truly reliable objective method of measuring the amount of spasticity, and we decided to rely on our own subjective impressions of the amount of spasticity present. We recorded this in our notes as absent (—), minimal (±), mild (+), severe (++), or very severe (+++).

None of the cases had had any form of physiotherapy in the institution before Tolseram was administered, although simple forms of this were initiated in several cases once a noticeable improvement had been demonstrated.

A brief description of the individual cases and their responses will now be given:

1. *Male aged* 19 *years*

Spasticity was first noticed at 6 months. At 4 years he could no longer stand or walk, and was treated for a short time at Uplands Orthopaedic Home, Pietermaritzburg.

Before Tolseram treatment was begun he showed severe spasticity of all the limbs and neck, he grimaced continually, his speech was quite unintelligible, he had difficulty in swallowing, and salivation was marked. He could only move around by sliding on his buttocks on a piece of leather.

At the end of the 1st week of treatment spasticity was no longer present in the neck, and it was markedly diminished in the limbs. He could now feed himself, and swallowed with less difficulty. Grimacing and salivation were noticeably diminished.

At the end of the 2nd week grimacing and salivation were absent, and spasticity in the arms and legs had further diminished. He was now able to walk a few steps with assistance—something he had not done for many years. At the end of the 3rd week he could walk fairly well while pushing a wheel-chair. His appetite had increased prodigiously and his general physical condition had improved noticeably. By the end of the 4th week he was generally happier and more cheerful, and was easier to manage. His speech was clearer and more intelligible. This improvement has been sustained on the lowered maintenance dose after 4 weeks.

2. *Male aged* 10 *years*

Had encephalitis at 2 years. Three months later he developed numerous attacks of petit-mal and signs of Parkinsonism.

Before treatment he showed severe spasticity of all the limbs, marked tremor in the arms, and gross incoordination. Patellar and ankle clonus were present and his plantar reflexes were extensor. Speech was markedly slurred and indistinct, and salivation was severe. He could not sit up without assistance, could not walk and had to be fed, and his personal habits were faulty.

At the end of the 1st week of treatment rigidity in the arms and legs was considerably diminished, tremor of the arms had ceased, and salivation was noticeably less. The ankle clonus had disappeared, although knee clonus was still present.

At the end of the 3rd week spasticity in all limbs was minimal, and knee clonus was absent. He could now sit up unassisted, and could feed himself reasonably well. When he wished to urinate he asked for the bottle. At the end of the 4th week his speech was much more distinct and he asked to be taken to the lavatory to defaecate, i.e. his personal habits were now clean. He could walk the length of the ward with minimal support. This improvement has persisted after 4 weeks on a low maintenance dose.

3. *Male aged* 24 *years*

At 10 years of age he suddenly lost the use of his left arm and leg and by the time he was 15 he showed the typical features of a spastic hemiplegia. In 1955 all the toes on his left foot were amputated because of a plantar flexion deformity which hindered walking.

Before treatment was begun he showed marked spastic rigidity of the left arm and leg. The arm was kept fully flexed at the elbow and showed severe athetotic movements. Coordination was poor and he could perform the grossest movements only, with difficulty.

At the end of the 1st week of treatment there was no change apparent on physical examination, but the patient (a high-grade defective) stated his left arm felt more relaxed. At the end of the 2nd week the arm was noticeably less spastic and was not kept fully flexed any longer. He could open his left hand voluntarily, and could pick up a small pin off the table without undue difficulty. The leg showed diminished spasticity, and he stated he now walked better and with less discomfort.

At the end of the 3rd week the athetoid movements in the arm were hardly noticeable, while spasticity had decreased still further. He stated he could now walk 'a hundred times better', and the leg showed no spasticity on examination. At this stage simple physiotherapy for the left arm was begun. At the end of the 4th week the arm was carried practically fully extended, and he had good control over it. He felt his walking was still improving. After 4 more weeks on only a maintenance dose improvement was sustained.

4. *Male aged* 47 *years*

His condition set in at 3 years after a febrile illness.

Before treatment he showed moderate spasticity of arms, legs and neck. He walked with difficulty, ate slowly and spilt a good deal of his food. Salivation was marked. At the end of 2 weeks of treatment there was some diminution in spasticity. At the end of the 3rd week there was no further improvement despite increased dosage, and treatment was discontinued.

5. *Male aged* 53 *years*

He was normal till 14, when he developed epileptic seizures followed by spastic paralysis of both legs. For the last 18 years he has been confined to a wheel-chair. Before treatment his legs showed moderate spasticity, with bilateral patellar clonus and a positive Babinski. He had bilateral club-foot. At the end of the 2nd week of treatment spasticity had disappeared and clonus was absent. At the end of another week the patient stated that his legs felt more relaxed. During the 4th week of treatment he made an attempt to walk which was unsuccessful largely owing to the gross fixed deformity of his feet. He is more placid and happier, and is now adjusting well to vocational training, though still confined to his wheel-chair.

6. *Male aged* 23 *years*

No previous history is available. Before treatment was begun he showed a right-sided hemiplegia, with moderate spasticity of the arm and leg, patellar clonus and a positive Babinski. At the end of the 1st week of treatment the patellar clonus was absent, but there was no further improvement in spite of increased dosage of Tolseram. Treatment was discontinued at the end of the 3rd week.

7. *Male aged* 4 *years*

A case of apparently congenital spastic quadriplegia. Before treatment he showed severe spasticity of all the limbs and was completely helpless. There was marked salivation, which diminished after one week of treatment. As no further change occurred the dosage was increased at the end of the 2nd week. No further improvement was noted on examination, but the nursing staff reported that he moved around more freely in his cot. The dosage was increased again but with no further improvement, and treatment was discontinued.

8. *Male aged 6 years*

He had basal meningitis at 2 months, followed by hydrocephalus and spastic paralysis. A craniotomy was performed by a neurosurgeon in Johannesburg with no improvement.

Before treatment was begun he showed spasticity of arms, legs and neck, and was completely helpless. At the end of the 1st week there was diminished spasticity but no further improvement resulted even after the dose had been increased twice. Treatment was then discontinued.

9. *Female aged 5 years*

Spastic quadriplegia and epilepsy present since birth. Before treatment she showed moderate spasticity of arms, legs and neck, and she was completely helpless. As treatment brought about no change in spite of 2 increases in dosage, it was discontinued in the 4th week.

10. *Male aged 5 years*

A boy who developed normally until he was 18 months old, when he suddenly became comatose and remained unconscious for a week. When he regained consciousness he was unable to walk or talk and showed spastic paralysis. An air-encephalogram showed right fronto-parietal cortical atrophy.

Before treatment was begun he showed spasticity of arms and legs, most marked on the left, and neck rigidity. He used only his right hand, was unable to walk, and grimaced continually. At the end of a week's treatment the grimacing was less marked and the spasticity of the neck and limbs had diminished. At the end of the 2nd week there was no further improvement on examination, but he could now stand and take a few steps with assistance. At the end of the 3rd week spasticity in the left leg and arm had diminished still further. He could now kneel in his cot unassisted. Further treatment produced no other improvement, but the improvement gained has been sustained after 4 weeks on a maintenance dose.

CONCLUSIONS

Of the 10 cases treated with Tolseram, in only one case (no. 9) could it be said that there was no response at all, although in 4 others (nos. 4, 6, 7, and 8) improvement was only transient and the treatment was ultimately discontinued.

The other 5 cases showed sufficient improvement to warrant continuation of maintenance doses of the drug, while in 3 cases (Nos. 1, 2 and 3) improvement can fairly be described as striking. One therefore feels justified in stating that Tolseram is worthy of a trial in all forms of spastic paralysis, more especially as it appears to be quite safe and unaccompanied by any serious side-effects.

SUMMARY

Mephenesin carbamate has been administered to 10 cases of spastic paralysis for a period of 8 weeks. Five cases showed some improvement and, of these, 3 showed a striking improvement.

We are grateful to Dr. I. R. Vermooten, Commissioner for Mental Hygiene, for permission to publish this paper, and to Messers. E. R. Squibb and Sons, Johannesburg, for a supply of Tolseram.

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AMOEBIC PERICARDITIS: A CASE REPORT

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Pericarditis is a rare complication of amoebic abscess of the liver. Reviewing the literature, Carter and Korones[1] reported a total of only 44 proved cases of suppurative amoebic pericarditis for the period 1885 to 1950. The mortality rate was very high, and diagnosis during life was made in only 2 cases, one of which recovered. In an unselected series of 2,000 autopsies performed at King Edward VIII Hospital during a 5-year period 1950-55, 8 cases of suppurative amoebic pericarditis were found. The number of autopsies performed was less than 10% of all deaths.

The condition may present in the following ways:

1. Cases of liver abscess with which is associated a pericardial friction-rub or electrocardiographic changes suggestive of pericarditis. There is no pericardial effusion or cardiac distress and the condition clears up as the liver abscess is treated. This is probably not very uncommon with abscesses of the left lobe of the liver.

2. As a serous (sympathetic) pericardial effusion without frank rupture of the abscess into the pericardium. When the diagnosis of liver abscess is not apparent this type may easily be confused with pericarditis from other causes, especially tuberculous pericarditis. The serous effusion may become purulent.

3. Sudden rupture of the liver abscess into the pericardium may occur, with suppurative pericarditis. This may present like the case described below, but sudden collapse and rapid death may occur.

The following case-history illustrates some typical clinical features of suppurative amoebic pericarditis.

CASE REPORT

An African male 29 years old was admitted to King Edward VIII Hospital, Durban, on 12 November 1954 complaining of severe pain in the left hypochondrium and slight non-productive cough, for 6 weeks. The pain had become progressively worse since its onset. There was no history of previous dysentery or other significant illness.

Examination. The patient, a well built and well nourished man, was acutely ill and distressed. His temperature was 103°F. The jugular venous pressure was not raised and there was no oedema. There was a very tender fluctuating swelling of the anterior abdominal wall in the left hypochondrium extending down from the costal margin and about 2½ inches in diameter. The surface of the swelling was smooth, with normal overlying skin.

The pulse was normal and the blood pressure 140/60 mm. Hg. The apex beat was easily palpable and not displaced. The heart sounds were of normal intensity and a pericardial friction-rub was heard at the apex.

Special investigations were as follows:

Blood: Hb. 5·6 g.% (38%). P.C.V. 20%. M.C.H.C. 28%. White blood-cells 23,000 per c. mm. polymorphs 90%, lymphocytes 9%, eosinophils 1% mononuclears 0%). ESR 76 mm./hr (Wintrobe).

Stool: Normal.

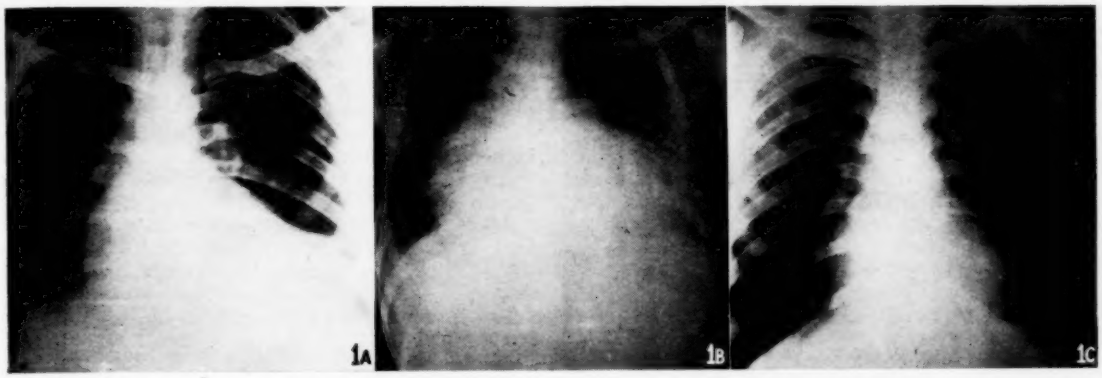

Fig. 1. A: Taken on the day of admission, showing elevation of the left dome of the diaphragm. B: 12 hours after rupture into the pericardium showing great increase in the size of the heart shadow. C: 1 month after discharge from hospital. The heart is now normal radiographically.

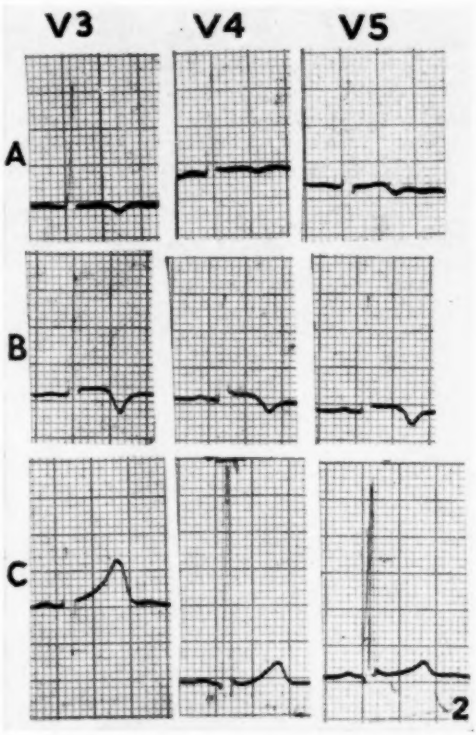

Fig. 2. A: 4 days after admission, showing inverted 'T' waves. B: 1 day after rupture into the pericardium. C: 1 month after discharge from hospital. The 'T' waves have become normally upright. Note also the increase in voltage of 'R'.

Radiograph of chest on admission (Fig. 1A): 'The left dome of the diaphragm is elevated, with some pleural reaction at the left base. A radiograph of the abdomen and fluroscopy of the chest indicated that the stomach with its normal air bubble was being displaced posteriorly by a large abscess in the left lobe of the liver.

An *electrocardiogram* taken 4 days after admission showed 'T' wave changes compatable with pericarditis (Fig. 2A).

Progress. Treatment with Camoquin[2] was started on the day of admission and a blood transfusion of 1 pint of whole blood was given on the 4th day. Three days after admission 500 c.c. of thin 'anchovy sauce' pus was aspirated from the abdominal swelling. Four days later annother 300 c.c. of pus of a similar nature was removed from the same site. The patient was now very much improved and his temperature was normal. This improvement continued until the evening of his 11th hospital day, when he developed a sudden severe lower substernal pain. His condition deteriorated rapidly and he became very dyspnoeic. The neck veins became engorged and there was pitting oedema over the sacrum. Pulsus paradoxus was present. There was now no palpable cardiac impulse and the heart sounds were faint and distant. Immediate aspiration from the original abdominal site yielded 300 c.c. of typical 'anchovy sauce' pus. The following day a radiograph of the chest showed a great increase in the size of the heart shadow (Fig. 1B). The pericardial sac was aspirated through the left 5th intercostal space 3/4ths of an inch lateral to the mid-clavicular line and 600 c.c. of thin 'anchovy sauce' pus was removed. The laboratory report on this fluid was as follows:

Macroscopic: Turbid blood-stained fluid with a large clot.

Microscopic: Pus ++. Erythrocytes +++. Organisms not detected (neither acid-fast bacilli nor amoebae were detected).

Protein 4·6%.

The patient improved almost immediately. The apex beat was now palpable in the mid-clavicular line and the heart sounds became louder.

Treatment with Camoquin was stopped and a course of emetine hydrochloride. 1 gr. daily for 10 days and procaine penicillin, 600,000 I.U. twice daily by injection, was started. He was also given 2 c.c. of mersalyl intramuscularly and this was continued twice weekly. The emetine was followed by a course of Chloroquin, 250 mg. twice daily by mouth for 20 days.

Five days later the pericardium was again aspirated and 150 c.c. of a light-chocolate-coloured pus was removed. The abdominal swelling was aspirated through the original site immediately afterwards and 800 c.c. of a similar chocolate-coloured pus was obtained. Aspiration of the pericardium and liver abscess was

attempted 7 days later, but no pus was obtained. The patient improved steadily and was discharged from hospital 40 days after admission symptom-free and with no signs except that the ECG was still abnormal, showing inverted 'T' waves in the limb leads and leads V3-V6.

He returned to hospital for review 1 month after discharge. He was feeling well and no abnormal signs were found. The electrocardiogram and radiograph of the chest were now both normal (Fig. 2C and Fig. 1C), as was the blood count. The ESR was 4 mm. per hour (Wintrobe).

When he was last seen 2 months after discharge from hospital he was quite well.

DISCUSSION

The patient presented with an amoebic abscess of the left lobe of the liver and a pericardial friction-rub. On the 11th day of admission the abscess ruptured into the pericardium.

The pericardial friction-rub was a significant finding, indicating that more serious pericardial complications were likely. This has also been the experience of other authors.[1,3]

The electrocardiographic findings shortly after admission confirmed that pericardial involvement had already occurred.

I have, however, seen cases with friction-rub and similar electrocardiographic changes that recovered uneventfully on conventional treatment without showing any evidence of serious cardiac involvement.

There are too few records of successfully treated cases to indicate clearly what are the best methods. It is clear, however, that emetine or Chloroquin must be given to eradicate the amoebae in the tissues. One might argue that there is cardiac embarrassment and for this reason emetine should be avoided, but I am not convinced that Chloroquin is as rapidly effective in tissue amoebiasis as emetine and would prefer the latter drug, at any rate up to a total dose of 6 gr. Chloroquin could be given simultaneously with, or after, the emetine.

Huard and Meyer-May[4] recommend surgical drainage of the liver abscess and pericardium but, unless aspiration was technically very difficult because of thick pus or inaccessability of the abscess, I should prefer to avoid surgery since the patient is gravely ill and the risk of secondary infection is greater than with aspiration. Both pericardium and liver abscess should be aspirated.

As with uncomplicated liver abscess it seems logical to give an intraluminal amoebicide such as diiodohydroxyquinoline to eliminate bowel parasites, when the patient has recovered from the acute episode.

In the case reported here recovery seemed complete, but the follow-up is short and eventual constrictive pericarditis may be a possibility. The remarkable absence of scarring in the liver following amoebic abscesses encourages one to think that the cure may be permanent.

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ELECTRICAL APPARATUS FOR MEDICAL PURPOSES

A letter on this subject dated 15 December 1954 from the Postmaster General to the Registrar of the South African Medical and Dental Council was published in the *Journal*[1] on 19 March 1955. The Postmaster General has since addressed two further letters, dated 27 June 1956 and 21 August 1956, to the Registrar, who has sent them to the *Journal* for publication:

(1) 27 *June* 1956

With reference to my . . . letter of 15 December 1954, I have to inform you that the period allowed for the conversion of electro-medical equipment at present in use to new frequencies has been extended by one year to 1 January 1958.

The tolerances applicable to the various frequencies are:

Frequencies	*Tolerance*
13,560 Kcs	± 0·05% of frequency
27,120 Kcs	± 0·6% of frequency
40·68 mcs	± 0·05% of frequency
2,450 mcs	± 50 mcs of frequency
5,850 mcs	± 75 mcs of frequency

(2) 21 *August* 1956

With reference to my . . . letter of 27 June 1956, it has now been decided that old apparatus may continue to be used indefinitely on a non-interference basis but if interference with radio reception is caused the owner will be requested to convert the apparatus to one of the new frequencies.

1. Frequencies of Electrical Apparatus for Medical Purposes (1955): S. Afr. Med. J., **29**, 287.

COST OF THE AMBULANCE SERVICE

Mr. J. M. Williams, Deputy City Treasurer, Cape Town, has addressed under date 11 July 1956, the following letter to the Secretary of the Medical Association of South Africa:

I have been requested by the Secretary for Health to communicate with you in connection with the high cost of running the ambulance service incurred by this Council as the controlling local authority for the conduct of the Cape Peninsula Local Authorities Ambulance Service.

While local authorities are responsible for the conduct of the ambulance service, the Department of Health accepts responsibility for the cost of conveying indigent patients to and from hospital.

The ambulance service is not part of the free hospitalization scheme conducted by the Provincial Hospital Department, which is responsible only for the free treatment of patients when within its hospitals.

It is enquired whether the assistance of your Association could be enlisted to seek the cooperation of the medical profession to reduce the cost of the Cape Peninsula ambulance service, whose vehicles convey nearly 100,000 patients a year over a distance

of more than 800,000 miles per annum at an estimated net cost of over £90,000 during 1956, after deduction of fees from all who can pay.

I therefore ask if it is possible for you to circularize the members of the medical profession in an endeavour to reduce the number of patients conveyed to the minimum by requesting ambulances only in cases where patients cannot get themselves to hospital by means of public or other transport, and then only in cases of necessity and emergency, bearing in mind that the great majority of patients conveyed are indigent, from whom the Council cannot obtain payment.

I thank you for any assistance which you may be able to render in this connection.

THE TOMLINSON REPORT

EXTRACT FROM THE SUMMARY OF THE REPORT OF THE COMMISSION FOR THE SOCIO-ECONOMIC DEVELOPMENT OF THE BANTU AREAS WITHIN THE UNION OF SOUTH AFRICA

PARAGRAPHS DEALING WITH VITAL STATISTICS AND HEALTH

The Commission, which consisted of Prof. F. R. Tomlinson (Chairman), Mr. M. D. C. de Wet Nel, M.P., Mr. C. W. Prinsloo, Mr. J. H. J. van Rensburg, Mr. G. J. Badenhorst, Mr. C. B. Young, Prof. C. H. Badenhorst, Prof. F. X. Laubscher (resigned and succeeded by Prof. J. H. R. Bisschop), Dr. J. H. Moolman, and Mr. F. H. Botha (Secretary), presented its report in typed form on 1 October 1954. The printed abridged report (the Summary), prepared by the Commission itself, was published in 1956.

The following extract is a copy of paragraphs dealing with vital statistics and health, which constitute little more than one-twentieth part of the text of the Summary.

IN PART I: A BROAD PERSPECTIVE

IN CHAPTER 7: THE POPULATION PROBLEM IN SOUTH AFRICA

I. GROWTH OF POPULATION

1. According to the census of 1951, the population of the Union of South Africa consists of 2,643,000 Europeans, 8,535,000 Bantu, 367,000 Asiatics, and 1,103,000 Coloured persons. The total population increased by 144 per cent, namely from 5,176,000 to 12,646,000, between 1904 and 1951. In consequence of their greater absolute numbers, the Bantu have contributed most to this increase, to wit, 5,044,000 in comparison with 1,526,000 in the case of Europeans, and 657,000 and 243,000 in the case of Coloured persons and Asiatics repectively. Of the four groups, only the Asiatics have increased in relative importance to any considerable degree. The numbers of Bantu and Coloured persons today represent more or less the same percentage of the total population as at the beginning of the century, 67·5 per cent and 8·7 per cent respectively. The European section has diminished slightly in numerical importance and forms 20·9 per cent of the total today in comparison with 21·6 per cent in 1904. There are about 3,229 Bantu, or taken as a whole 3,785 non-Europeans, for every 1,000 Europeans.

III. MORTALITY

6. On a comparison of mortality conditions among theur fo population groups, the Europeans appear to be in the most favourable position, with a crude death-rate of less than 9 per 1,000 in 1952. This compares with 10·9 for Asiatics and 19·9 for Coloured persons. In the case of the Bantu for whom vital statistics are not available, it is estimated at between 27 and 32 per 1,000. The death-rates for the three first-named population groups all show a long term decline, while those for the Bantu probably only began to decrease in the most recent period.

7. The decline in mortality must be attributed mainly to a decline in deaths among children during their first year of life. Thus, the European infant mortality rate declined from 52·9 on an average during 1936-1941, to 34·6 in 1952, and that of Asiatics and Coloured persons from 93·1 to 71·3 and from 164·9 to 140·6 per 1,000 live births respectively. Among the Bantu, nearly one-fifth of the children born alive die before they reach their first birthday, as a result of the unhygienic customs and conditions under which they are born and grow up. Socio-economic progress thus reveals itself particularly in the saving of children lives, a process which aggravates the burden of dependency in an underdeveloped community.

8. The average expectation of life at birth, obtained from life-tables, affords a more accurate indication of health conditions than the ordinary death-rate, which is influenced by the particular age and sex composition of a population. Such life-tables, based on the experience of the period 1945 to 1947, indicate that at birth the average European child has a probable duration of life of 66 years and an Asiatic, Coloured and Bantu child 50·3, 42·8 and 36·4 years respectively.

9. In comparison with the urban areas, living in the rural areas appears to be a cause of longer life, in the light of the lower mortality rates prevailing among rural Europeans, Asiatics and Coloured persons. This urban-rural differential is, however, diminishing. It is not impossible that the process of urbanization could have caused increased mortality—among Bantu at the beginning, but that the increasing utilization of medical facilities and improved living conditions, may have altered the differential in favour of the city.

IV. FERTILITY

10. The Coloured community, with an ordinary birth-rate o 45·5 per 1,000 on the average, for the period 1936 to 1952, is the most fertile. Among the Bantu, for whom vital statistics are not available, it has been determined indirectly that the rate, with a lower and upper limit of 43 and 47 per 1,000 respectively, probably does not differ much from that of the Coloured people. Then follow the Asiatics (Indians) with an average rate of 38·6 births per 1,000 during the period 1936 to 1952, while the Europeans reveal the lowest fertility rate; their birth-rate is lower than that of Asiatics by more than 12 per 1,000. Of all the ethnic groups, only the Europeans have experienced a secular decline in their birth-rate.

11. Because the Asiatics have a relatively low deathrate, their net natural increase over the entire period 1936-1952, at a rate of 25 per 1,000 on the average, was the highest. Then follow the Coloured people with a rate of 23·2 per 1,000 and the Europeans with 16·9. Since 1951, however, the Coloureds surpass all other groups. In spite of their high fertility, the rate of natural increase of the Bantu is only 15 per 1,000 as a result of the high mortality among them. The Net Reproduction Rate, which allows of a more accurate comparison of potential population growth, amounts to approximately 1·45 for Bantu, 1·54 for Europeans, 2·03 for Coloured persons and 2·12 for Asiatics.

12. An analysis of the age distribution of married women, indicates that the Asiatic population includes the largest relative number of potential mothers at the most fertile phase of life. In this respect, the Europeans are the worst off, while the Bantu and the Coloured people occupy an intermediate position. Moreover, marriage does not play so important a part in the process of propagation among the two last-named groups as among Europeans and Asiatics. Illegitimate births seldom constitute less than one-third of the total Coloured births, and it may be expected that the relative figure will also be comparatively high among urban Bantu.

13. Fertility differentials are found in respect of urban and rural communities and socio-economic classes. The European rural community is more fertile than the urban dwellers, while the

opposite tendency has been found among Coloured people and Asiatics. Although, in consequence of the excess of males, the birth-rate of the Bantu will be lower in the cities than in the rural areas, it may be doubted whether the fertility of urban women is lower. The contrary appears to be more probable.

14. While the size of the European family is negatively correlated with the social status of the father, measured, *inter alia*, by income and occupation, we find that Bantu and Asiatic families are larger in proportion to income. In contrast with the Europeans, the size of families in the last-mentioned cases is not necessarily a consequence of the economic status, but may also be a cause thereof.

V. AGE AND SEX COMPOSITION

15. In South Africa, as in the rest of the world, more boys than girls are born. While, however, an average of 105·7 European boys are born for every 100 girls, the ratio is much lower among non-Europeans, namely less than 103 : 100 in the case of Coloured people and Asiatics. It appears to be still lower among the Bantu. However, boys are subject to a higher mortality with the result that the excess of males disappears at about the age of 45 to 50, so that at the higher age levels there is an excess of females. The Asiatic population represents an exception to this, inasmuch as the expectation of life of their girls at birth is lower than that of their boys, a phenomenon which must be mainly attributed to the early marriages and high fertility of the females.

16. The masculinity ratio of the total population in 1946, was 101·4, 104·2, 109·7 and 100·7 for Europeans, Bantu, Asiatics and Coloured persons respectively. This represents a diminution since the beginning of Union, save in the case of the Bantu. The causes of the decline are the decrease, after 1904, in European immigration—the majority of whom were males, the sex-selective emigration of Indians and the greater decline in mortality among female Coloured persons than among males. The masculinity ratio of the Bantu, on the contrary, has been raised by increasing immigration of Foreign Natives, among whom males predominate numerically. The exclusion of the latter lowers the masculinity ratio from 104·2 to 95·5.

17. Among the four ethnic groups, only the Europeans have 'aged' as a result of the lowering of the birth-rate and decreased immigration, that is to say, the relative number of children has diminished while older persons have increased in numerical importance. The small measure of 'aging' apparently experienced by the Bantu group has been artificially induced by the reinforcement of those at the productive period of life, by temporary migrant labourers. When these alien-born elements are eliminated, it appears that the age distribution of the Bantu has remained almost stationary. The Coloured and Asiatic populations have even become 'younger'; that is to say, the number of children has increased relatively. This is a consequence of the maintenance of a high birth-rate, while mortality has diminished, and as already mentioned, the saving of lives is largely concentrated at the first year of life. An accessory factor in the case of Asiatics is the age-selective effect of emigration, in so far as it was especially men in the middle age groups who emigrated to India.

18. As in the case of any other under-developed population which has a high birth-rate and whose death-rate has not yet reached the low level of Western countries, our non-European population is weighed down by the burden of a high dependency ratio, that is to say, there is a large number of children under 15, who may be regarded as non-productive. Although the number of old persons of 65 and older, who do not normally perform productive work, is small, this does not compensate for the large percentage of dependent children. The total number of persons in these two age groups expressed as a percentage of those in the ages 15 to 64, amounts to only 58 in the case of Europeans, but to 74 among the Bantu and to 85 and 95 among Coloured presons and Asiatics respectively. When only the indigenous Bantu population is taken into account, their dependency ratio amounts to 82 instead of 74 as stated above.

In simpler terms this burden of dependency implies a greater number of dependent children per family; a factor which renders the attainment of a higher level of material welfare more difficult.

VI. URBANIZATION

19. The urbanization of the South African population is a consequence of economic development, especially of the secondary industries which for the most part are established in urban areas. The rural areas do not offer sufficient opportunities for work or opportunities which are sufficiently remunerative. The Bantu Areas are an outstanding example of such rural areas.

20. While at the time of the census of 1904, fewer than one-quarter of the total population of the Union lived in the urban areas, the proportion in 1951 was 42·6 per cent. The absolute numbers rose from 1,222,000 in 1904 to 5,374,000 in 1951. To this increase the Bantu contributed 1,954,000 in comparison with 1,469,000 by the Europeans. The latter are the most urbanized group with 78·4 per cent of its members resident in towns, as compared with 77·5 per cent and 64·4 per cent in the case of Asiatics and Coloured persons respectively. Although the 1951 census only registered 27·1 per cent of the Bantu population, or 2,312,000, as living in the urban areas, this, compared to an initial percentage of 10·4 per cent in 1904, represents a much more rapid increase during the past half century than is found among any of the other groups. In 1904, they constituted less than 30 per cent of the urban inhabitants. Today their share is 43 per cent. Notwithstanding this, the increase of the rural population of the Union must be largely ascribed to the growth of the Bantu population, in view of the fact that the Asiatic and Coloured inhabitants of the rural areas have not increased to any significant extent and that the number of European rural dwellers has remained practically unchanged.

21. In order to determine the intensity of the urbanization process, the increase in urban inhabitants may be expressed as a percentage of the increase of the total population. In the case of Coloured persons and Asiatics, the proportion in question was sometimes considerably higher than 100 per cent in earlier years, but in recent times it appears to have declined to 90 per cent and lower. The intensity of European urbanization has increased with the years, to reach 115 per cent. during the decade 1936 to 1946, after which it declined slightly. Among the Bantu, there was a secular rise in the rate of urbanization, until during the years 1946 to 1951 the Bantu urban dwellers were increasing at a rate of 60 per cent of their total population increase, or by 85,000 persons per year on the average. However, the position of the Bantu differs from that of the other groups inasmuch as a large number of the former who are counted in the urban areas at the time of census, are not permanent inhabitants, but temporary migrant labourers from the Bantu Areas or from outside the Union. There are probably not more than 2,000,000 indigenous Bantu resident in urban areas, instead of the 2,312,000 mentioned above.

22. A large measure of concentration of urban inhabitants has been taking place in the four industrial areas of the Western Cape, Southern Transvaal, Durban-Pinetown, and Port Elizabeth. Out of a total of 5,374,000 urban dwellers, 3,451,000 were living in these four areas in 1951. Almost two-thirds of the urban Bantu were concentrated here in 1951, after a numerical increase in the course of three decades at a much faster tempo than in the case of the other three groups. Striking evidence of this movement is the influx into the Western Cape Region where the Bantu was almost an unknown figure in earlier years.

23. The age distribution of the urban population groups, reveals the usual pattern of a concentration of large numbers in the middle ages, a consequence of the fact that it is more especially persons of working age who migrate to the cities. Among Europeans there are 1·9 persons of working age for every 1 person in the 'unproductive' ages. Among Bantu the ratio is 3·3 persons, and while there is an excess of women in the case of Europeans and Coloured persons, we find a numerical preponderance of Bantu males in the towns. This is associated with the custom among the Bantu males of periodically seeking work outside their reserves, and with the large-scale temporary immigration from our neighbouring territories in which, in the nature of things, women cannot participate so easily. Nevertheless, it is a characteristic of this urbanisation that Bantu women are taking part in it to an increasing extent.

VII. HOW MANY BANTU ARE PERMANENTLY SETTLED IN THE URBAN AREAS?

24. When it is desired to determine how many of the Bantu are already 'permanently' settled in the towns and cities, we are confronted with the problem that the interpretation of the term 'permanent' presents many difficulties in itself, and that probably a number of degrees of 'permanency' can be distinguished. Various methods have been applied to determine the extent of the

established Bantu urban population. The conclusion has been drawn that there may have been a minimum of 1,036,000 and a maximum of 1,618,000 of such Bantu in 1951, and that the actual number cannot differ much from 1,500,000. On the basis of data relating to family dwellings for the Bantu, it may be assumed that 314,000 families have already accepted the urban areas as their abode. Migration of Bantu women to the towns is usually of a permanent nature. At the end of 1951, there was a shortage of 167,000 family dwellings, and provision for this need will require the expenditure of approximately £35,000,000.

VIII. GEOGRAPHICAL DISTRIBUTION

25. As regards the geographical distribution of the population among the four provinces, the 1951 census disclosed that the largest number of persons, namely 38 per cent, and also the largest number of Europeans and Bantu, 45·6 per cent and 40·7 per cent of the two groups respectively, were living in the Transvaal. The large majority of Coloured persons and Asiatics is concentrated in the Cape Province and Natal respectively. Until 1936, the Cape was the most populous province. The fact that the Transvaal has now assumed this position, must be attributed particularly to the industrial development on the Witwatersrand, to which not only Europeans but also Bantu from the Cape and Natal reserves have migrated either temporarily or permanently.

26. The distribution of the Bantu between the Bantu Areas and the rest of the country is of importance. According to the data of 1951, 27·1 per cent of them were resident in urban areas, 42·6 per cent in the Bantu Areas and 30·3 per cent on European farms and in the remaining rural areas. The last-named portion, the remaining rural areas, did not contain more than about 6 per cent of the total. These figures include persons of foreign birth, of whom most are only temporary inhabitants. If they are excluded, the share of the urban areas in the distribution of the settled population decreases to less than 25 per cent, and that of the Bantu Areas rises to more than 45 per cent.

Viewing the matter historically, the urban areas have increased in importance as temporary or permanent dwelling-places for the Bantu, and the Bantu Areas, European farms and other rural areas have diminished in importance. To the increase in the number of Bantu urban residents since 1936, the European farms and other rural areas contributed 40 per cent, the Bantu Areas 8 per cent, foreign countries 23 per cent and the natural increase of the towns themselves 29 per cent.

27. It should be emphasised that these conclusions are based on census data which indicate the *de facto* distribution at a given period. In Chapter 13, for instance, it is shown that the *de jure* population of the Bantu Areas—that is to say, those who regard these areas as their home, and some of whom were only temporarily absent when the census was taken—amount to more than half of the total.

IN PART II: THE BANTU AREAS

IN CHAPTER 13: THE POPULATION OF THE BANTU AREAS

I. SIZE OF POPULATION

1. On the basis of census data and estimates furnished by Native Commissioners, the Commission ascertained that the *de facto* population of the Bantu Areas during the census taken in May, 1951, amounted to approximately 3,633,000. This figure has reference to the number actually present in these Areas and, therefore, differs from the *de jure* population which also includes the number of temporary absentees. The 3,633,000 Bantu are distributed among the five main administrative regions of the Bantu Areas as follows: Ciskei 264,000, Transkei 1,202,000, Natal (including Zululand) 926,000, Northern Areas 927,000, Western Areas 314,000.

2. Until 1946, the *de facto* population of the Bantu Areas increased at a slower rate than the total Bantu population and also slower than the indigenous (or South African-born) population. Between 1946 and 1951, however, the increase took place at a higher tempo than that of the latter. This must be attributed chiefly to the extension of the area of land exclusively reserved for the use of the Bantu, a conclusion which is confirmed when the distribution of the population increase among the five main regions, is compared with the geographical distribution of this territorial expansion. The numbers of the inhabitants of the Bantu Areas in the Transkei, Ciskei and Natal, which have received the smallest increase of land since 1936, have also increased least, and have, in fact even decreased since 1946. These tendencies may be regarded as an indication that the three regions named, have reached saturation point at their present level of development.

3. During the census of 1951, 42·6 per cent. of the total Bantu population, and 46·3 per cent. of the indigenous Bantu, were present in the Bantu Areas. This represents a slight decline in comparison with 1946.

II. HOW MANY OF THE BANTU REGARD THE BANTU AREAS AS THEIR HOME

4. At the time of the census in 1951, according to the calculations of the Commission, there were about 569,000 persons temporarily absent from the Bantu Areas. If this number is added to the *de facto* population of 3,633,000, we get a *de jure* population of 4,202,000. That is to say, more than 4,200,000 Bantu still had their homes in the Bantu Areas. This represents an increase of more than 800,000 over the figure of 1936, when the total was 3,410,000 and the number of absentees 447,000. It follows from this, that more than half the indigenous Bantu of the Union regard the Bantu Areas as their home.

IV. MORTALITY

9. The results of various sample studies undertaken in connection with mortality among the Bantu, do not coincide. Evidence points to the fact, however, that about one-fifth to one-quarter of the children born, die within the first year of life. Among all populations, the infant mortality rate is higher than that for older persons, and this tendency is found in an intensified form in undeveloped communities. Nearly 55 per cent. of those born, attain the working age of 16 years. The causes of the high mortality rate may be briefly listed as follows: The low material standard of living, the high birth-rate, the unhygienic conditions, the exposure of children, the primitive custom of compelling the suckling to take substantial nourishment, damage to the rectum; etc. It is difficult to determine how far the Bantu abandon their customs and to what extent their ignorance diminishes when they come into contact with European customs and morals. Bantu women are, however, making use on an increasing scale of maternity facilities and medical advice.

10. In Chapter 7 of the Report, the average mortality rate for the total Bantu population of the Union, was stated as being between 27 and 32 per 1,000. It is possible that large-scale urbanization may have raised the death-rate for urban areas above that of the Bantu Areas in the beginning, but that the position has been changing in recent times.

V. FERTILITY

11. To obtain information in connection with fertility, the Commission undertook sample studies in the following regions: Zululand, Transkei (Umzimkulu and locations), Northern Transvaal (planned and unplanned locations), Olifantsrivier, Njelele and Bochem. On this basis it was ascertained that the average Bantu family in the Bantu Areas, which functions as an economic unit and may consist of a father, one or more mothers, their own children and dependents, consists of 6·27 members.

12. Moreover, it was found that the average number of living children per *family* (excluding dependents), based on the arithmetical average, amounted to 3·7, and the number per *wife* to 3·17. The difference between the two figures is due to the fact that in some families there is more than one mother. The data collected reflect, however, a very great variation in the net fertility of marriages. For example, in 5·2 per cent of the families there were no children, while in 6·8 per cent there were 8 and more children. The greatest number, however, namely 65·6 per cent disclosed between 2 and 5 children. The large variation is a function, *inter alia*, of the composition of the families, some of which include 2 or 3 mothers, and the variety of ages among parents.

13. If the infant mortality is taken into account, it can be determined that the average number of live births per woman included in the sample surveys, amounted to 5·16, and the average number per family to 6. If the mortality among women during their fertile period, is also taken into account, the number of

children to whom a married woman will give birth before she reaches her 46th year, may be put at between 6·5 and 7.

14. The Commission found a reasonably high degree of positive correlation between the incidence of monogamous marriages and the number of children per wife. That is to say, polygamy tends to lead to a smaller number of births per woman than in the case of monogamous unions. Consequently, the promotion of monogamy by the Christian religion and contact with Europeans, may lead to an increase in fertility.

15. In the Bantu Areas, in accordance with the custom that the infant must first attain a measure of independence from constant maternal care before a subsequent child is procreated, about three years usually elapse between the birth of one child and that of the next. Viewed in this light, the absence of males as a result of the system of migratory labour, should not have much influence on fertility, except in cases where they remain away longer than say, two years. It may also happen that men in the Bantu Areas act as substitutes, in the spirit of the Bantu tradition that the reproductive faculties should not be left unutilised. The custom with regard to the spacing of births may also result in the fertility of women in the tribal territories being lower than that of women in the urban areas where the decline of family life, and the disappearance or diminution of the influence of public sanctions, encourage illegitimacy.

CHAPTER 15: HEALTH

I. HEALTH CONDITIONS IN THE BANTU AREAS

1. As the Bantu Areas lie scattered among the European areas in all four provinces of the Union, diseases occurring in a particular part of the Union are liable to affect the Bantu and European areas in that region to the same extent.

2. Vital statistics reflect the health of a community. Much of the information required in respect of the Bantu Areas is, however, unreliable. The notification of births and deaths became compulsory for the rural Bantu only in July, 1953, while, as many such Bantu either do not seek assistance or consult witch doctors, the incidence of disease is not accurately known. An indication of health conditions in the Bantu Areas can, however, be obtained from reports submitted by district surgeons and others and from surveys. Ill-health can be considered under two general headings, viz. non-infectious and infectious conditions:—

3. *Non-infectious Conditions.*—There is a fair amount of nutritional disorder among the Bantu. There is also a high incidence of eye disease and of blindness. Primary carcinoma of the liver is relatively more common in the Bantu than in the European. Acute appendicitis, formerly a condition seldom found amongst Bantu, is now occurring more frequently in the reserves. Umbilical hernia is commonly seen especially in the younger age groups. Diabetes mellitus is rare. Pneumonia is common, as are also scabies and impetigo.

Figures reflecting the incidence of dental caries amongst the Bantu vary considerably. It appears that the incidence is lowest in the primitive Bantu and highest in those who have been in contact with our European civilisation for a long period.

4. *Infectious and Communicable Conditions.*—As a result of unhygienic conditions and the abundance of flies, gastro-intestinal troubles including typhoid fever, as well as helminthic infestations are relatively common.

Venereal diseases. All the five venereal diseases occur in the Union. Syphilis and gonorrhoea are the diseases most commonly encountered; chancroid occurs less frequently and is mainly confined to the coastal areas; lymphogranuloma venereum and granuloma inguinale are seen only occasionally. As venereal disease is not notifiable in the Union, no reliable statistics are available. Results of surveys which have been carried out from time to time show a positivity rate for syphilis which as indicated by a positive Wassermann, varies considerably. Two of the more recent surveys gave the following results: 35·27 per cent in the Polela area in Natal (1941/46) and 7·4 per cent in random batches of Bantu from the Eastern Cape Bantu Areas (1947). The State provides a nation-wide free anti-venereal disease service available to all racial groups, and with modern methods of treatment this is proving very effective.

Tuberculosis. Surveys conducted with the miniature mass X-ray mobile units in the Bantu Areas, suggest that pulmonary tuberculosis occurs as frequently in the rural as in the urban areas and that the incidence rate is probably not lower than 0·8 per cent. A survey of 7,569 rural Bantu in the Northern and Eastern Transvaal in 1953, showed active disease in 0·7 per cent of those X-rayed. A survey of 2,653 Bantu in the Port Sheptone district in 1950, revealed 1·5 per cent with active disease. The problem is being dealt with actively by means of an increase in hospital accommodation, generous subsidies to local authorities for the care and treatment of cases, the provision of mobile X-ray units for the detection of cases and the provision of the most modern medical and surgical treatment.

Bilharzia. Some of the areas most heavily infested with bilharzia are in the Transvaal—especially the lowveld. Surveys conducted recently showed a high incidence rate of the urinary as well as the intestinal form—as high as 60-90 per cent of the Bantu examined in certain areas, having one or other of these infestations. The disease occurs also in Natal and to a much lesser extent in the Eastern Cape.

Malaria. Malaria is most liable to occur mainly in the Northern Transvaal and Natal. The intensive preventive measures applied have now brought this desease well under control so that the Bantu as well as the Europeans in these areas where it was formerly rife, are now free from the ravages of this disease.

Leprosy. As a result of the policy of compulsory segregation, which has been strictly applied over many years, the incidence of leprosy in the Union is comparatively low and has been estimated recently at 0·77 per 1,000. The prognosis in this disease is improving rapidly as a result of the new sulphone therapy. There are at present only some 2,000 Bantu patients under treatment at the various institutions. Because many are now discharged after a relatively short period of treatment, with the disease arrested, more and more Bantu sufferers now voluntarily seek treatment.

Trachoma. Although less than 100 cases of trachoma in all races are usually notified each year, surveys conducted recently suggest that the disease may occur more frequently than was formerly supposed in the Bantu areas.

Epidemic Typhus Fever. Epidemic typhus fever occurs mostly amongst the non-Europeans and generally runs a mild course in the Bantu. At least 90 per cent of cases occur in the Ciskei-Transkei areas. Since 1944, this disease has been brought under control, especially in these Bantu Areas, by field units employing D.D.T.

Smallpox. Smallpox usually but not always runs a mild course in the Bantu among whom it was very prevalent until 1944. Since that year, teams of lay vaccinators have virtually eliminated this disease from the Bantu Areas.

Plague. Plague which is spread by certain veld rodents occurs sporadically over a wide area of the Union particularly the Orange Free State, parts of the Northren Cape and of the South Western Transvaal. The Ciskei-Transkei area is relatively free except for the Quamata basin in the St. Marks District. A few human cases occur each year, mostly amongst Bantu who are more likely to come in contact with infected rodents in the veld. The mortality rate is high for both Europeans and non-Europeans, especially when the disease occurs in the pneumonic or septicaemic forms. Systematic antirodent measures have reduced the incidence of the disease and the advent of the sulphonamides and streptomycin has improved the patients' chances of recovery considerably.

5. Human cases of actinomycosis, hydatid cyst and malta fever occur only occasionally in the Union.

6. Only 3-4 human cases (all races) of rabies are notified each year.

7. Human trypanosomiasis does not occur in the Union, although tsetse flies exist in a defined area in Natal.

8. Tape-worm infestation is common in the Bantu Areas.

II. HEALTH SERVICES FOR THE BANTU AREAS

9. The Bantu Areas do not constitute a separate health entity for which special statutory arrangements exist. For health administrative purposes, each Bantu area is an integral part of the local authority district within the boundaries of which it is located. Health services are provided by the various agencies, as a rule irrespective of the ethnological origin of the community concerned. The agencies providing these services can be considered under the following headings:

A. Services Provided by Statutory Bodies

10. These bodies are the Central, Provincial and the Local Authority Governments. The primary responsibility for carrying

out the provisions of the Public Health Act rests with the local authority for the area concerned. Its health functions which are detailed in the Act, relate, *inter alia*, to the control of infectious disease and where necessary for this purpose, to the provision of isolation facilities and cleansing and disinfecting stations, while it is also its duty to ensure that sanitary conditions are satisfactory and that domestic water, milk and food are produced and sold under hygienic conditions.

11. The Bantu Areas are all rural areas and are, therefore, administered by the rural local authorities, i.e. by divisional councils or by magistrates acting as local authorities in terms of section 9 of the Act, when they act on the authority and instructions of the Ministry of Health. As the magistrate lacks the technical qualification and has no health staff, he depends on the assistance of the Union Health Department's district surgeons and other regional staff; the expenditure incurred on health work in these districts is recoverable from the Provincial Administration concerned except for that portion which would have been refunded by the Department to a statutory local authority.

12. The Union Health Department has, for administrative purposes, divided the Union into six health regions. Each regional office operates under the general direction of the Department's head office in Pretoria and administers or supervises the services in the region it controls. The Department provides the following services:—

13. A *curative* medical service, through its district surgeons, health centres and other clinics. This service is mainly for indigents to which category the bulk of the Bantu in the reserves belong. It includes the supply of free medical appliances (spectacles, artificial limbs, etc.) to indigents. The district surgeons also do the medico-legal work in their areas and provide a nation-wide free anti-venereal disease service.

Hospital services, for the following categories of patients—the mentally ill, the feeble minded, tuberculosis cases, lepers and a few small institutions for special cases of venereal disease.

A *laboratory service*, either through its own laboratories at Cape Town and Durban, or by arrangement with provincial hospital laboratories or the laboratories of the South African Institute for Medical Research.

A *preventive service*. In areas where the magistrate is the local authority, the regional staff undertakes the work necessary. This staff also supervises the preventive and general health services of the local authority areas, gives advice on technical difficulties, may coerce the local authority when necessary or may temporarily take over its functions, e.g. when an outbreak of infectious disease is not being dealth with satisfactorily. The regional office also administers the Foods, Drugs and Disinfectants Act, and the provisions of the Medical, Dental and Pharmacy Act relating to habit-forming drugs and poisons.

A *financing service*, arising out of the statutory refunds and grants-in-aid provided for in the Public Health Act in respect of health services and facilities provided by local authorities, provincial administrations and charitable bodies including missionary societies. The regional staff are responsible for the general supervision of these subsidised services.

14. The provincial administrations are responsible for the provision and maintenance of general hospitals which of course form a very large and important part of the medical and health services of the country. In addition to providing their own hospitals the provincial administrations contribute towards the capital cost of mission hospitals which are generally situated in the Bantu Areas. The operational costs of assisted hospitals are also subsidised by the provincial administrations, each province having its own basis on which this is calculated. Broadly, the provinces are responsible for general hospital services while the Union Health Department is responsible for special hospitals as indicated above, and for all extra-institutional services.

15. A measure of correlation and co-ordination of the general hospitals and other personal health services provided by the Provincial and the Central Governments respectively, is secured by the Central Health Services and Hospitals Co-ordinating Council.

16. In exercising their control of local authorities, the provinces have enacted ordinances which confer or impose powers and duties of a complementary nature to the Public Health Act, on local authorities and empower them to make 'health' by-laws which are usually based on standard regulations drawn up by the provinces with the technical advice of the Union Health Department.

B. Services provided by Non-statutory Health Bodies

17. *The South African National Tuberculosis Association*, (SANTA) deals with tuberculosis. It has raised funds from the public and establishes and maintains tuberculosis settlements with financial assistance from the Union Health Department in respect of capital and operational costs.

Missionary societies maintain mission hospitals and sometimes operate district nursing services with liberal financial assistance of the Union Health Department.

Certain large *employers* of labour, such as the gold mining companies, provide extensive medical services. They carry out medical examination of recruits for their respective industries and promote the health of their labourers by good feeding, housing and the provision of adequate medical and hospital facilities. A certain amount of health educational work is also undertaken.

Charitable organisations, in the form of voluntary committees provide district nursing services with the financial assistance of the Union Health Department. Financial assistance is also available from the Deferred Pay Interest Fund in those areas where Bantu are recruited for employment on the mines.

Other voluntary bodies, such as the S.A. Red Cross Society, the S.A. Council for the Blind, the Cripple Care Association, and the National Council for the Deaf provide services which in most cases are available to all races, including of course the Bantu.

C. Services provided by Private Practitioners

18. Most of the doctors in the Union, including specialists, provide their services by private practice at a fee payable by the patient. There is no racial bar between doctors and patients and most of the doctors in the Bantu Areas are Europeans.

19. A fair number of nurses practise their calling privately either through a nursing agency or as independent practitioners, either as general nurses or midwives or in both these capacities. If considered necessary and in the public interest, the Union Health Department supplements the earnings of a private nurse, European or non-European.

20. The great majority of dentists in the Union provide their services by private practice at a fee payable by the patient. There is no racial bar between dentists and patients. A measure of free dental services available to all races is provided by the provincial administrations, the Union Health Department, certain local authorities and voluntary organisations subsidised by the statutory bodies, and by the two universities with dental faculties.

IN PART III: DEVELOPMENT OF THE BANTU AREAS

CHAPTER 41: PROPOSALS FOR A HEALTH SERVICE

1. INTRODUCTION

1. In Chapter 15, the existing health services are reviewed and it is indicated that the district of a magistrate or a divisional council, in the Cape Province, constitutes the district of a rural health authority. For health administrative purposes, the Bantu Areas falling within the boundaries of such a district, form an integral part of that district. Certain difficulties arise out of this arrangement. Most of the rural local authorities have done little towards development of their health services, their activities in this regard often being limited to action in connection with outbreaks of infectious disease. The position is aggravated by the fact that the Bantu Areas within their boundaries, contribute little or nothing towards the expenditure incurred on health services by the local authority concerned. Confusion is created by the fact that, unlike magistrates in these districts, Native Commissioners do not provide health facilities, while the multiplicity of agencies providing health services described in Chapter 15, leads to overlapping and maldistribution of available services and facilities.

2. These difficulties could be alleviated by having a single health authority to provide all the facilities required for a complete service in the Bantu Areas. This health authority should employ Bantu wherever possible although in the initial period they should

work under the supervision of suitable Europeans to supervise the introduction of the service.

II. REQUIREMENTS FOR A FULL HEALTH SERVICE

3. The following facilities will be required for such a service:
(i) hospitals in the following categories:—
(a) general (including maternity, orthopaedic, chronic sick and convalescent);
(b) infectious diseases (general infectious disease, tuberculosis, venereal disease, and leprosy); and
(c) mental (including institutions for the feebleminded);
(ii) clinics (operated by specialists, medical officers of health or clinical medical officers, general practitioners, dentists and clinic nurses on outpatient lines) for—
(a) specialist attention;
(b) medical and dental attention including minor ailments, dressings, etc.;
(c) ante-natal and post-natal attention including birth control;
(d) paediatrics, including preventive immunization facilities; and
(e) venereal disease and tuberculosis diagnosis and treatment on out-patient lines;
(iii) laboratories;
(iv) ambulances;
(v) domiciliary medical services;
(vi) nursing services by district nurses (for minor ailments, general nursing assistance and midwifery), and health visitors (doing health educational work with special reference to tuberculosis, venereal disease and other infectious diseases);
(vii) non-personal health services—sanitation, environmental health, etc., by sanitary inspectors with field assistants; and
(viii) training facilities.

4. The personnel for such a service will comprise medical specialists, general practitioners, medical officers of health, clinical medical officers, dentists, clinic nurses, district nurses, health visitors, sanitary inspectors and field assistants.

A survey of the facilities available to the Bantu Areas revealed the following:—

A. Personnel

5. To date no Bantu has been registered as a *medical specialist* in any of the 21 recognised specialities. Although specialist practice is almost confined to the larger towns, facilities exist whereby Bantu indigents, like paying patients, may be sent to such places where specialist services are available.

6. The number of *doctors* registered in the Union in 1948, has been compared with the 1946 census figures, and it was found that there were then 2,381 persons of all races per doctor in the Union as a whole, while in the five Bantu Areas there were 4,640 Bantu per doctor. It is usually considered that there should be about one medical practitioner per 1,000 population.

7. There were 5,777 medical practitioners on the Medical Register in 1951, of whom 61 were Bantu; of the 55 practising in the Union, 29 or 53·5 per cent had settled in the Bantu Areas.

8. There are 444 district surgeons in the Union of whom 385 are part-time and 59 whole-time. Of the district surgeons 200 are stationed in districts with extensive Bantu Areas; 167, including three missionary doctors and one Bantu private practitioner, are part-time district surgeons, the remaining 33 being whole-time district surgeons.

9. *Medical Officers of Health* are responsible for the health services which the employing local authority provides. The Union Health Department refunds one-third of the salary of a whole-time medical officer of health to the local authority. As far as is known, no Bantu practitioner in the Union has the diploma in public health which is necessary for appointment to a post of whole-time medical officer of health.

Clinical Medical Officers are engaged by local authorities in clinical work either in an isolation hospital or in an out-patient clinic. The Union Department refunds seven-eights of the salary of whole-time clinical officers, and the same proportion of the expenditure incurred by local authorities employing part-time officers on a 'per hour session' basis. It is not known what number of clinical medical officers are employed in the Bantu Areas.

There were 991 registered *dentists* in the Union in 1951. It is considered that there should be no more than 5,000 non-Europeans per dentist. There are no Bantu dentists practising in the Union, and no facilities exist for their training; it is not known what dental clinical facilities exist in the Native Areas.

Clinic and hospital nurses are the counterpart of the clinical medical officers working in clinics or isolation hospitals.

District nurses are expected to devote most of their time to domiciliary visits. They may have either the general or the midwifery qualification, or both, depending on the requirements of the employing body. In the Bantu Areas, Bantu nurses with provincial hospital certificates, mission hospital certificates or mines hospital certificates are also acceptable for refund purposes if no nurses with registerable qualifications are available. There are at present 204 district nurses employed in the Bantu Areas, with the assistance of the statutory refunds, and also 14 subsidised nurses.

Health visitors are normally employed on health educational and preventive work in respect of, for example, infectious diseases and child welfare. They may conduct ante-natal and post-natal clinics under the supervision of a doctor. The incumbents must have either the midwifery or the general certificate as well as a health visitor's certificate. A mothercraft certificate is always regarded as a strong recommendation for appointment. It appears that a number of Bantu nurses have qualified for this type of work, although the number working in the Bantu Areas is not known.

Health Inspectors attend to the non-personal health services for which local authorities are responsible. The Union Health Department refunds one-third of a health inspector's salary to the employing local authority. Bantu may qualify as health inspectors but few, if any, have done so.

Field Assistants are uncertified persons employed, mainly by the State, on field control work in connection with malaria, bilharzia, typhus, plague, small-pox and general sanitation work, such as D.D.T. deverminization duties, work as lay vaccinators and organising rural Bantu communities for immunization. The few Bantu employed as field assistants, are proving most useful.

B. Hospitals

10. The beds for Bantu patients in hospitals in the Bantu districts, are available to patients from both the 'Bantu' and 'European' Areas of these districts, and also from surrounding districts. The 'population per bed' ratio is, therefore, not related to the population of the Bantu Areas alone, but is based on the total Bantu population of the Bantu Area district.

11. In general hospitals, there is 1 bed per 644·3 Bantu population. A ratio of 1 bed per 500 Bantu population is considered to be a reasonable standard for Bantu rural areas. On this basis, there is a shortfall of 2,563 beds. Mission hospitals provide 43·8 per cent of the available general beds. There is no accommodation for the chronic sick.

12. There is a total of 2,217 beds for Bantu suffering from infectious diseases—excluding leprosy—in the Bantu Area districts, and 51·5 per cent of these are provided in mission hospitals. The bed position regarding infectious disease patients is not unsatisfactory except that there is a shortage of beds for patients suffering from pulmonary tuberculosis; the number of beds available for leprosy patients, exceeds the demand.

13. The hospital accommodation available for mentally disordered Bantu patients, falls far short of the demand while there are no institutions for feeble-minded Bantu patients.

C. Clinics

14. Out-patient clinics are attached to most general hospitals, both provincial and missionary. Some such clinics provide for dental sessions.

15. Detached general out-patient clinics are maintained in some urban areas located in the Bantu Areas districts. They are established and operated by local authorities on a seven-eights refund payable by the Union Health Department or, where they are run by a provincial administration, on a 100 per cent refund basis.

16. Tuberculosis and venereal disease clinics are provided and operated by local authorities on a seven-eights refund payable by the Union Health Department. There are seven tuberculosis and 22 venereal disease clinics in the Bantu Areas districts.

17. Grants are made annually by the Union Health Department to voluntary societies, in respect of medicines and dressings used at 47 dispensaries in the Bantu Areas.

18. Most of the 204 district nursing services in the Bantu Areas,

are operated from clinics which serve as headquarters. The type of service provided depends on the qualifications of the nurse employed. The buildings and equipment are provided by the employing body.

19. Doctors, usually district surgeons, authorised by the Union Health Department, visit areas lacking medical aid in various districts, in terms of Section *four* of Act No. 36 of 1927, to provide an out-patient service. The Union Health Department also authorises district surgeons to visit specific areas in order to treat venereal disease. At the same time other patients may be seen. In view of the modern treatment employed, these visits are for a limited period only, so that accommodation is usually not provided.

20. At the health centres, free medical, maternity and child welfare services—including immunization work and health education—are provided on an outpatient basis. A certain amount of domiciliary work within a radius of about three miles of a centre is also undertaken by the staff. The staff usually comprise medical officers, nurses, midwives and health assistants, the latter being employed as recorders, educators and sideroom workers. In the Bantu Areas districts, there are 12 health centres, some of which have sub-centres.

21. Ambulance services in the Bantu Areas are inadequate. The Union Health Department provides ambulances at its hospitals and at some of its health centres, and bears the cost of transportation of indigent patients as a measure of poor relief.

Local authorities in the larger centres operate ambulance services for both infectious and non-infectious patients, while some charitable organisations such as missions, the Red Cross Society and the St. John's Ambulance Brigade, also operate a few ambulances.

D. Training Facilities

22. There are facilities in most spheres for the training of Bantu men and women as doctors, nurses and medical auxiliaries. The courses of training and the examinations are identical for European and non-European candidates. Non-Europeans including Bantu, have trained as doctors at the Universities of Cape Town and Witwatersrand since 1937, and in 1952 a medical school, specially for the training of non-European doctors, was established at the Natal University. The normal course extends over six academic years (seven at Natal University), and this is followed by a year of compulsory internship. The Universities of Cape Town and the Witwatersrand also conduct post-graduate medical education.

23. There are two dental schools, at the Universities of Pretoria and the Witwatersrand, respectively. The course of training extends over five academic years.

24. Courses of training for certificates in general nursing and in midwifery, registrable with the S.A. Nursing Council, are provided for all races, at the provincial hospitals. Courses of training for the hospital certificate (which is not registrable with the S.A. Nursing Council), are provided for Bantu women at certain provincial, mission and mine hospitals. Post-registration training for senior nurses, is available at three of the medical schools but has not as yet been taken advantage of by Bantu nurses. Certain technical colleges give a course of training for the health visitors' and school nurses' certificates, which is available to all races. There are at present no facilities available in the Union for Bantu girls who wish to nurse mental or mentally defective patients, or who wish to qualify for the mothercraft certificate.

25. Courses of training for the general certificate for sanitary (health) inspectors, are available at various technical colleges and are open to matriculants of all races. Qualified health inspectors may also train for the further certificates in meat and other foodstuffs inspection, tropical diseases and fumigation. The necessary facilities for training for the latter certificates, are provided by certain large local authorities approved for this purpose by the Union Health Department.

26. Courses of training for pharmacists are normally provided at technical colleges, but a parallel system of university training is now being developed. In addition to their academic training, candidates must serve a period of apprenticeship either in a pharmacy or, by a recent decision, in a selected hospital. The fact that the practical training can now take place in a hospital, will overcome the difficulty previously existing for non-Europeans when the apprenticeship had to be served in an 'open' shop.

E. Conclusions

27. A survey of health facilities in the Bantu Areas, indicated that the number of available trained units is inadequate. This is also true of hospitals and related facilities with the exception of hospitals for leprosy, general infectious diseases and venereal diseases. Many of these facilities are, moreover, located outside the Bantu Areas, or are not sited with due regard to the needs of these Areas as a whole, largely due to the fact that these facilities are provided by several different agencies. This could be improved by transferring the health responsibilities of these agencies to a single authority which would be responsible for providing a comprehensive and co-ordinated service. This service should be staffed by Bantu as far as possible to attract trained Bantu to these Areas, but should be operated initially under the direction of Europeans until the Bantu can assume full responsibility.

28. Practical considerations indicate that the Union Health Department, and not an independent Bantu health authority, should develop and operate the service. A network of clinics should form the basis of the service, and the Bantu concerned should contribute to the cost of the service through a health tax. In addition, patients should normally make a small contribution towards the cost at the time the service is rendered. This service should be supplemented by private practice by Bantu.

III. RECOMMENDATIONS FOR A FULL HEALTH SERVICE

29. (i) The Native Commissioners should, for purposes of the Public Health Act, replace magistrates and divisional councils as the rural local authorities for these Bantu Areas. The latter should, if possible, be consolidated into compact blocks, and be divided into a suitable number of Native Commissioner districts.

(ii) In the Bantu Areas, the health responsibilities of all the statutory authorities and also ultimately, with their prior agreement, of the charitable organisations and missionary societies, should be transferred to the Native Affairs Department which should then delegate these responsibilities to the Union Health Department.

(iii) The Union Health Department, in consultation with the Department of Native Affairs, should then be responsible for providing the full range of medical, dental, nursing, laboratory and preventive services—including the necessary hospitals, clinics and ambulances—the basis of which would be formed by a network of clinics. Meantime, the Union Health Department should have powers to control extensions to existing services.

(iv) In order to ensure satisfactory liaison, the Chief Health Officer should appoint a senior medical officer of his staff to act as his adviser in connection with the Bantu Areas, and to co-operate with the Native Affairs Department.

(v) This Bantu health service should be developed on simple lines and financed from a special Bantu Health Services Trust Fund to be established by the Department of Native Affairs and maintained partly by a health tax imposed on all taxable Bantu in the Bantu Areas. Those patients able to pay a small amount should make a contribution at the time of the service, at least in respect of the medicines and dressings supplied. Preventive services and immunization against infectious diseases, should, however, be provided free of charge. The extent of the services provided will naturally depend upon the moneys available in the Fund.

(vi) The Bantu health service should be staffed as far as possible, by qualified Bantu personnel working initially under the general supervision of Europeans who should, however, gradually be replaced by suitable Bantu incumbents. Bantu private practitioners should be permitted to supplement this service. Non-Bantu private practitioners already in practice in these areas should not be disturbed, but the influx of additional prospective non-Bantu private practitioners should be controlled by a permit system.

IN PART V: RECOMMENDATIONS AND POSSIBLE IMPLICATIONS

IN CHAPTER 50: RECOMMENDATIONS

VII. SOCIAL SERVICES

D. Health

(i) The health conditions of the Bantu and the health services made available in the Bantu Areas, are analysed in Chapter 15. Recommendations in regard to the institution of a comprehensive

medical service for the Bantu Areas, are set out in detail in Chapter 41. It was found that, with the exception of hospitals for leprosy and general infectious diseases, the present hospital facilities in the Bantu Areas, are not capable of providing for the need that exists there.

(ii) The Commission is of opinion that the present problem in regard to medical services can be overcome by the establishment of a Bantu Health Service, supplemented by private medical doctors, dentists, nurses and other practioners.

(iii) In order to privide for the special requirements of the Bantu Areas, the Commission recommends that Native Commissioners should replace both Magistrates and Divisional Councils, as rural health authorities in the Bantu Areas.

(iv) Regarding the establishment of a Bantu Health Service, the Commission recommends that the Union Department of Health, the provincial administrations, local authorities as well as all private undertakings, eventually including the missionary societies, should transfer their health service and responsibilities in the Bantu Areas, to the Department of Native Affairs. This Department should then delegate these responsibilities to the Union Department of Health. Simultaneously, the Commission recommends the appointment of an officer of senior rank in the Department of Health, with the following principal duties:—

(*a*) to study the public health problems of the Bantu Areas for the purpose of keeping the Secretary for Health informed; and

(*b*) to act as liaison officer between the Secretary for Health and the Department of Native Affairs.

(v) With reference to the proposed Bantu Health Service, the Commission recommends further that—

(*a*) it assumes the health services and responsibilities of all the other bodies concerned, eventually including those of the mission societies;

(*b*) it assumes responsibility for hospital services (including the erection of new hospitals), and controls the expansion of private hospitals, clinics etc.;

(*c*) it should provide a full range of medical, dental, nursing, laboratory and preventive services, through the medium of a network of Bantu clinics;

(*d*) this service be financed from a special Bantu Health Services Trust Fund which will have to be established by the Department of Native Affairs, and partially maintained by a health tax imposed on all taxable Bantu in the Bantu Areas; and.

(*e*) the personnel of this health service should consist, as far as possible, of qualified Bantu, and that the European personnel be gradually replaced by suitable Bantu.

(vi) In order to encourage Bantu medical doctors to practise among their own people in the Bantu Areas, the Commission recommends that European and other non-Bantu practitioners should only be allowed to practise in the Bantu Areas under a permit system.

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Chirurgia, 1954.
Medical journal of mutual aid association, 1955.
De Natuur-geneeswijze, 1955.
Revista medica, 1955.
Royal college of surgeons of Edinburgh. Journal, 1955.
Viata medicală, 1955.

DEATH OF DR. F. P. BESTER

We regret to announce the death of Dr. F. P. Bester, which took place at Paarl, C.P., on 31 August 1956. Dr. Bester qualified 58 years ago and had practised for many years at Paarl, where he had latterly lived in retirement.

He had taken a prominent part in public medical affairs and was held in affection and respect by a large circle of friends. An In Memoriam notice will be published in a future issue of the *Journal*.

PASSING EVENTS : IN DIE VERBYGAAN

Dr. J. D. Jacobs, M.D. (Rand), M.R.C.P. (Edin.) has commenced practice as a specialist physician at 184 Lister Buildings, Jeppe Street, Johannesburg. Telephones: Rooms 22-8150, Residence 42-1272, Emergency 22-4191. None of these numbers are in the current telephone directory.

* * *

South African Council for Scientific and Industrial Research. Postgraduate Bursaries for Directed Research. The C.S.I.R. invites applications for bursaries for work in its own laboratories during the year 1957. Bursaries will be for £400 a year each, tenable for one year at a time, and may be renewed if satisfactory reports are received on the bursar's progress. Applications must be made on a special form, and forms and regulations are obtainable from the Registrars of the South African Universities, or from the Secretary-Treasurer, C.S.I.R., P.O. Box 395, Pretoria. Applications should, where possible, be submitted through the Registrars of the Universities to reach the Council not later than 15 September 1956.

The following are among the fields of research which may be eligible for bursaries: The ecology of bilharzia-carrying snails in South Africa; Medical, physiological (nutritional aspects), agricultural and industrial applications of radio-isotopes; Technology and use of soya beans for human consumption in South Africa; Protein chemistry; Electro-encephalography; Efficiency and productivity of Native operatives; Planning of Native townships; Environmental influences on mental and physical growth.

* * *

The Cape Western Branch of the Medical Association of South Africa has great pleasure in inviting all members and their wives who happen to be in Cape Town on 3 October 1956 to the adjourned Annual General Meeting of the Association on that date, at which the newly inducted President, Dr. J. S. du Toit, will deliver his Presidential Address. Association awards will also be presented. This meeting will take place in the Jamieson Hall, University of Cape Town, at 8 p.m. for 8.15 p.m. Dress formal and academic. Music and refreshments. Kindly signify your intention to be present to the Branch Secretary, Box 643, Cape Town, before 1 October so that the necessary catering arrangements can be made.

* * *

Dr. J. J. de Waal, F.R.C.P. (Edin.), D.P.H., D.T.M., has recently registered as a specialist physician and is practising at 207 Harley Chambers, Jeppe and Kruis Streets, Johannesburg. Telephones, Rooms 22-1666, Residence 42-4310.

Dr. J. J. de Waal, F.R.C.P. (Edin.), D.P.H., D.T.M., wat onlangs as Spesialis-Internis geregistreer is, praktiseer te 207 Harley Chambers, Jeppe- en Kruisstrate, Johannesburg. Telefone, Kamers 22-1666, Woning 42-4310.

* * *

The Harveian Tercentenary Congress, London, 1957. To mark the tercentenary of the death of William Harvey, the Harveian Society of London is organizing an International Congress on the Circulation to be held on 3-7 June 1957 at the Royal College of Surgeons, London, and a session at Folkstone, Harvey's birthplace, on 8 June.

At the session to be held in London the following subjects will be dealt with: The circulation from the 17th to the 20th centuries; The regulation of the circulation; the results of cardiac surgery; The coronary circulation; The pulmonary circulation; The cerebral circulation; The splanchnic circulation; The peripheral circulation. At Folkestone addresses will be given on on Harvey's birthplace, Harvey at Cambridge, Harvey at Padua, and Harvey the Scientist.

In addition to British speakers there will be visitors from America, France, Germany, Sweden and Canada.

Further particulars may be obtained from the Hon. Secretary, Dr. D. Geraint James, 11 Chandos Place, Cavendish Square, London, W. 1.

* * *

Union Department of Health Bulletin. Report for the 7 days ended 23 August 1956.

Plague. Nil.

Smallpox. Transvaal. One (1) Native case in the Standerton district.

Typhus Fever. Nil.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Calcutta, Lucknow (India).

Smallpox in Rangoon (Burma); Phnom-Penh (Cambodia); Allahabad, Calcutta, Delhi, Karikal, Madras, Pondicherry, Tuticorin, Visakhapatnam (India); Makassar (Indonesia); Dacca (Pakistan); Dar es Salaam (Tanganyika).

Typhus Fever in Baghdad (Iraq); Cairo, Damietta (Egypt).

* * *

Dr. Morris J. Cohen who travelled with the South African Medical and Goodwill group for 10 weeks on the Continent and Britain

has now returned to Durban, and has resumed practice at 82 Medical Centre, Field Street.

* * *

Dr. L. Eales, of the Department of Medicine, University of Cape Town and Groote Schuur Hospital, has been awarded a Rockefeller travelling fellowship in Clinical Investigative Medicine. He will be leaving on 7 September by air for 6 months' research and study in the USA. His main interest is Renal Disease, and for the greater part of his stay he will be working in Professor Rytand's Department at Stanford University, San Francisco. Thereafter he will visit several of the major American centres. *En route* he will also visit centres in England. He will be accompanied by Mrs. Eales.

REVIEWS OF BOOKS : BOEKRESENSIES

MODERN TRENDS IN ORTHOPAEDICS

Modern Trends in Orthopaedics. Second Series. By Sir Harry Platt, LL.D., M.D., M.S., F.R.C.S., F.A.C.S. Pp. 331, with illustrations. 73s. post free. London: Butterworth & Co. (Publishers) Ltd. South African Office: Butterworth & Co. (Africa) Ltd., Durban. 1956.

Contents: Contents of First Series. Introduction. Chapter 1. Reconstructive Surgery of the Hip Joint. 2. Peripheral Nerve Injuries. 3. The Role of Antibiotics in Treatment of Tuberculous Diseases of Bones and Joints. 4. Congenital Dislocation of the Hip. 5. Muscle and Tendon Transposition in Poliomyelitis. 6. Internal Derangements of Knee Joint and Allied Conditions. 7. Traumatic Paraplegia. 8. Pott's Paraplegia. 9. Displacement of the Upper Epiphysis of Femur. 10. Contractures of the Hand. 11. Fractures of the Neck of the Femur. Index.

This 'second series' is the product of an advancing science. It is gratifying to find that orthopaedics has made such strides as to warrant the periodic publication of its recent advances. The work is concise and condensed and, by its excellent choice of authors, is representative of the present outlook of British schools of orthopaedic surgery.

This book is obviously written by experts for the expert. Each subject is one uppermost in present development of this field of surgery, and the addition of personal and critical authors' viewpoints adds immensely to the value of the work. The choice of subjects has been pertinently made, touching on the day-to-day problems of the practising and teaching orthopaedist.

One of the most contentious problems in the field of orthopaedic surgery is the present-day use on an ever-increasing scale of foreign materials such as Vitallium and acrylic plastics. Many writers today strongly recommend the use of these. There remains, however, the viewpoint that in spite of their tissue-neutrality, such materials cannot be introduced into the human body easily, without complication or frequent failure. Therefore, difficulty is experienced by most surgeons in deciding whether to remain conservative and avoid the use of these materials or to follow the modern convention and give up not wholly successful older-fashioned operations in preference to these newer ideas. This applies especially to operations for hip pathology.

An extremely interesting lead is given in this matter by Norman Capener in the opening chapter, and although all the modern techniques are described by him, one detects a note of caution and conservatism throughout. Capener suggests that future advancement will be by the perfection of biomechanical synthesis, and not merely by implantation of mechanical devices.

The other chapters are equally well written and skilfully edited. The series is indispensible to orthopaedic surgeons and advanced orthopaedic students.

C.E.L.A.

YELLOW FEVER VACCINATION

Yellow Fever Vaccination. By Smithburn *et al.*, Geneva 1956. (World Health Organization: Monograph Series No. 30), 238 pages, 37 figures, select bibliography, index. Price £1 5s. $5.00, or Sw. fr. 15. French edition in preparation.

Contents: Introduction. Immunology. Immunology of yellow fever—Kenneth C. Smithburn. Dakar Vaccine. Preparation of yellow fever vaccine at the Institut Pasteur, Dakar—C. Durieux. Vaccination technique with yellow fever vaccine of the Institut Pasteur, Dakar—C. Durieux. Post-vaccination immunity with yellow fever vaccine of the Institut Pasteur, Dakar—C. Durieux & R. Koerber. 17D Vaccine. Production of 17D yellow fever vaccine—H. A. Penna. Administration of 17D yellow fever vaccine, with special reference to Brazil—H. A. Penna. Vaccination by scarification with 17D chick-embryo vaccine—G .W. A. Dick. Time of appearance and duration of immunity conferred by 17D vaccine—G. Courtois. Mass Vaccination. Mass yellow fever vaccination in French Africa south of the Sahara—C. Durieux. Mass vaccination against yellow fever in Brazil, 1937-1954—Caio de Souza Manso. Post Vaccination Reactions. Reactions following vaccination against yellow fever—George Stuart. International regulation. International regulation of yellow fever vaccination—P. H. Bonnel. Bibliography. Select bibliography on yellow fever vaccination. Index.

As indicated in the introduction to this monograph, yellow fever vaccination was first applied in French West Africa in 1934 (Dakar vaccine) and then in Brazil in 1937, since when many millions of persons have been successfully vaccinated and yellow fever as a dreaded disease has to a great extent lost its sting.

The chapters of this monograph have been compiled by many of those distinguished persons who individually played so conspicuous a part in the elucidation and development of a satisfactory vaccine, which has been such a boon to those resident in or traversing yellow-fever areas.

The development and manufacture of the various types of vaccine are fully set out. It is interesting to note that the Daker vaccine, administered by skin scarification, and frequently combined with smallpox vaccine, has found much favour in the French African possessions, where many millions of the indigenous population have, at low cost and with great speed, been satisfactorily immunized against yellow fever. This form of yellow-fever vaccine has, however, not met with the same degree of acclaim outside the French possessions and has to all intents and purposes been superseded by the 17D vaccine.

The relative merits and demerits of each type of vaccine, including the post-vaccinal reactions that can be expected from the use of each, have been succinctly set out by the authors.

The final pages of this most interesting and instructive monograph provide not only a select and full bibliography on yellow-fever vaccination, but also a most useful index for ready and rapid consultation.

E.D.C.

HUTCHINSON'S DIETETICS

Hutchinson's Food and The Principles of Dietetics. Revised by V. H. Mottram, M.A. and George Graham, M.D., F.R.C.P. Eleventh Edition. Pp. xviii + 630. 40s. net. London: Edward Arnold (Publishers) Ltd. 1956.

Contents: The History of Dietetics. Part One. Diet in Normal Life. I. Introductory, Definitions, Difficulties, Limits of Error and Action in Dietetics. II. The Functions of Food. (i) Supply of Energy. III. The Functions of Food (continued). (ii) Supply of Body-building Material. IV. The Functions of Food (continued). (iii) The Supply of Elements other than Carbon, Hydrogen, Oxygen and Nitrogen. V. The Functions of Food (continued). (iv) The Supply of Vitamins. VI. Practical Aspects of Knowledge of Calories, Proteins, Mineral Elements and Vitamins. VII. The Processing and Storage of Foods. VIII. The Cooking of Foods. IX. Hygiene of Food. X. The Digestion, Absorption and Metabolism of Foods in Health. XI. Normal Dietetics. Part Two. The nature of Foods. XII. Foods Taken Mainly for Energy Purposes. XIII. Foods Taken Chiefly for Protein. XIV. Foods Taken Chiefly for Protein (continued). XV. Foods Taken for Mineral Elements and for Vitamins A. and C. (Ascorbic Acid). XVI. Foods taken Mainly for Flavour. Condiments. XVII. Beverages. XVIII. Principles of Feeding in Infancy. XIX. Principles of Feeding in Infancy (continued). XX. Principles of Feeding in Infancy (continued). Transitional Feeding. Some Proprietary Foods. XXI. The Principles of Feeding in Disease. XXII. The Principles of Feeding in Disease (continued). XXIII. Some Dietetic 'Cures' and 'Systems'. XXIV. Artificial Feeding and Artificial and Predigested Foods. Index.

This book is a remarkable tribute to Sir Robert Hutchison, whose portrait appears as its frontispiece. The book was first published in 1900 and the present 11th edition appears in 1956, when Sir Robert is still vigorous. The present editors, Dr. V. H. Mottram and Dr. George Graham pay a fitting tribute to that great man in their introduction.

The book is what its title indicates. It is primarily a book on food and the application of the principles of human dietetics. As such it is a mine of valuable information. There are not many questions one might want to ask about the nature of a foodstuff

and its constituents and physiological effects which are not answered and catalogued in the index. It is remarkably well up to date, although some of the recent information on essential fatty acids, amino acids and food additives will have to appear in the next edition. Its style is direct, pleasing and unambiguous. It is certainly a reference work of the greatest value to every practitioner who has to advise patients about their diets and to every medical student.

J.F.B.

CLINICAL MEDICINE

The Clinical Approach in Medical Practice. By G. E. Beaumont, M.A., D.M., F.R.C.P., D.P.H. Pp. 469, with 74 illustrations. 45s. net. London: J. & A. Churchill Ltd. 1956.

Contents: Part I. Descriptive Cases. How I Entered Basingstoke on a Milk Tanker. Pain in the Hip. Hepatic Lobectomy. A Solved Problem. The Missing Abdominal Reflex. 'Ulcerative Colitis'. The Young Athlete. Arthritis? An Early Country Case. Ovarian Asthma. A Fatal Error. The Tangled Skein. Bile Peritonitis. The Consultants' Dilemma. Sarcoidosis. Intermittent Jaundice. The Aching Side. Recurrent Attacks of Vomiting. My Inglorious Hour. Whose Was the Mistake? Pleural Effusion. The Catherine Wheel Headache. The Throbbing Trunk. Constitutional Jaundice. The Foster Kennedy Syndrome. Goitrogenous Asthma. The Premenstrual Tension Syndrome. Pyaemia. A Diagnosis in the Making. 'Arthritis' of Hip. Ileal Stasis. Wanted—A Diagnosis. Angina and Anaemia. Steatorrhoea. Polycystic Disease of Liver and Kidneys. Ten Minutes Too Late. Idle Thoughts. Part II. The Trials of the Tuberculous Resuscitation in Congestive Heart Failure. Idle Thoughts. Part III. Cases Demonstrated at the Bedside By Question and Answer. A Case of Oedema, Vertigo and Blindness. A case of Renal Colic and Haematuria. A Case of Vomiting. A Case of Jaundice. A Case of Gluteal Haemorrhage. A Case of Hoarseness. A case of Wasting and Weakness. A Case of Lumbar Pain. A Case of Cerebral Failure. A Case of blood in the Urine. A Case of Recurrent Abdominal Pain. A Case of Dyspnoea. A Case of Girdle Pains. A Case of Headache. A Case of Pains in the Head, Legs and Back. A Case of Pigmentation in the Skin. Idle Thoughts.

This is a companion volume to 'Applied Medicine' and is written in the same way in a series of descriptive cases and cases demonstrated at the bedside by question and answer. It varies from the former work, however, in the fact that the second part follows a new line being devoted to the consideration of two subjects—'The Trials of the Tuberculous' and 'Resuscitation in Congestive Heart Failure'.

Dr. Beaumont's cases make good reading and his particularly easy style adds greatly to the enjoyment of his book.

The aphorisms in his 'Idle Thoughts' at the end of each part are both apt and useful. Those who read the author's 'Applied Medicine' will enjoy its companion and those who read his present book will want to go back to enjoy the earlier work.

A.H.T.

ECZEMA IN CHILDREN

The Treatment of Eczema in Infants and Children. By Lewis Webb Hill, M.D. Pp. 79 + 39 illustrations. £1 14s. 0d. St. Louis: The C. V. Mosby Company. 1956.

Contents: 1. General Principles of Treatment. 2. Seborrheic Dermatitis. Leiner's Disease. Fungus Infections. 3. Secondary Infection. Infectious Eczematoid Dermatitis. Nimmular Eczema. Circumscribed Neurodermatitis. Contact Dermatitis. 4. Atopic Dermatitis. 5. Atopic Dermatitis (continued).

Dr. Hill, formerly director of the Eczema and Allergy Clinic at the Children's Medical Centre in Boston and lecturer in paediatrics at Harvary University, is amply qualified by his many years of personal experience to write on the treatment of eczema in children.

This book is primarily intended for paediatricians, having appeared in the latter half of 1955 as a series of articles in the *Journal of Pediatrics*. Dr. Hill writes in an easy, straightforward, almost conversational style, and presents his views and lines of treatment without any of that vagueness and doubt so often found in text-books.

The author discusses fully the values of drugs commonly used and naturally devotes much space to the use and abuse of the steroids. Most dermatologists will agree that hydrocortisone ointment does not do well where there is no active inflammation and a good deal of thickening—for such cases tar preparations are preferable. Oral cortisone must be avoided except for certain well-defined cases. In cases of ammonia contact-dermatitis due to napkins, mercuric chloride is preferable to all the modern fancy antiseptics; Dr. Hill says he has used it for 34 years without a single case of acrodynia.

Dr. Hill confesses that he often sends his cases to a dermatologist, usually with happy results, therein portraying a wisdom not always evident in less experienced paediatricians.

This small book is confidently recommended to all practitioners, whether specialists or not. They will find much of practical help to solve their problems in dealing with a difficult group of conditions.

J.J.J.

TEXT-BOOK OF MIDWIFERY

A Text Book of Midwifery. Sixteenth Edition. By R. W. Johnstone and R. J. Kellar. (Pp. xvi + 582, with 295 illustrations.) 35s. net (S.A. Price 36s.). London: A. & C. Black. 1955.

Contents: Section I. Anatomy and Physiology. Section II. Physiology of Pregnancy. Section III. Labour in the Various Presentations. Section IV. Physiology of the Puerperium. Section V. Pathology of Pregnancy. Section VI. Physiology of Labour. Section VII. Pathology of the Puerperium. Section VIII. The newborn Child. Section IX. Operative Obstetrics. Section X. Radiography in Obstetrical Diagnosis.

This text-book of midwifery covers the subject most comprehensively. Written in a clear and concise manner and well illustrated by diagrams and X-ray photographs, this book should be of inestimable value to the student and an excellent guide to the practitioner. If proof be needed of its popularity, it is to be found in the fact that no less than 5 new additions have been produced in the past 10 years.

Practical and useful advice is given in the section on antenatal supervision. The authors give a simplified and easily readable account of the embryological development of the placenta as well as recent views on placental anatomy.

In training students the term contractions or cramps should be used in preference to 'labour pains', which is unfortunately used frequently in the text. Lovset's manoeuvre, which has proved a useful method of dealing with extended arms in a breech presentation, is not mentioned in the management of this complication.

A curious feature recorded by the authors is that some observers have shown that two or three days before labour commences there is a loss of weight, which is so definite that it can be taken as an indication that labour is imminent. It would be interesting to follow up this observation.

An interesting point the authors make is that vaccination is not contra-indicated in pregnancy but is contra-indicated in the puerperium.

The distressing condition of incoordinate uterine action is clearly presented and practical advice given on its management. In dealing with concealed accidental haemorrhage no mention is made of the complication of afibrinogenaemia which requires the earliest detection and speedy correction if disaster is to be avoided.

The chapter on Breast and Artificial Feeding is presented by Professor R. W. B. Ellis and contains useful and up-to-date information on the subject.

This book as a whole is well produced and, like its predecessors, will be welcomed by all interested in the subject of Obstetrics.

S.B.C.

SYMPOSIUM ON HYPERTENSION

Ciba Foundation Symposium on Hypertension: Humoral and Neurogenic Factors. Edited by G. E. W. Wolstenholme, *O.B.E.*, M.A., M.B., B.Ch. and Margaret P. Cameron, M.A., A.B.L.S. (Pp. 294 + xiv, with 73 illustrations. 30s.) London: J. & A. Churchill Limited. 1954.

Contents: 1. Chairman's Opening Remarks. 2. Neural and Humoral Control of Blood Vessels. 3. Some New Aspects of Reflex Blood Pressure Regulation and Hypertension. 4. Hypertensive Disease without Hypertension. 5. Internal Secretion of the Arterial Wall in Blood Pressure Regulation. 6. Drugs Antagonistic to 5-hydroxytryptamine. 7. Quantitative Estimation of 5-hydroxytryptamine in Gastro-Intestinal Mucosa, Spleen and Blood of Vertebrates. 8. Chemical Screening Methods for the Diagnosis of Phaeochromocytoma. 9. Persistence of Hypertension after Removal of Paeochromocytoma, where Excretion of Adrenaline and Noradrenaline is Normal. 10. Experimental Studies on the Pathogenesis and Nature of Hypertensive Cardiovascular Disease. 11. Experiments on the Role of Vasoconstrictor Substances in the Mechanism of Renal Hypertension in Dogs. 12. The Relation of the Sustained Pressor Principle to Renin. 13. The Role of the Kidney in the Mechanism of Experimental Hypertension. 14. The Effect of Partial Renal Corticectomy on the Kidneys of Normal and Hypertensive Animals. 15. The Use of Ganglion Blocking Agents in Relation to Neurogenic Factors in Hypertension. 16. Lessons from Hexamethonium

Studies in Malignant Hypertension. 17. Catechol Amine Excretion in Urine in Cases of Hypertension. 18. The Relationship between Sodium, Arterial Hypertension and the Adrenal Glands. 19. The Study of Adrenal Insufficiency in Hypertensive Patients Submitted to Bilateral Sympathectomy and Unilateral Adrenalectomy. 20. Water and Electrolytes in Experimental Hypertension. 21. The Distribution of Fluid and Electrolytes in Experimental Hypertension. 22. The Importance of Sodium Chloride and its Ions in the Production and Treatment of Hypertension. 23. Chairman's Closing Remarks. Index.

There is an enormous literature on the important subject of hypertension. The aetiology, the epidemiology (on which more work needs to be done), the effects on the cardiovascular system, and other aspects of hypertensive vascular disease, have been considered by many investigators, but the problem is still unsolved. The complicated nature of the subject is revealed in this book. Varied opinions are expressed, on the basis of intensive experimental work, by the many contributors to the symposium. Perara and others suggest that hypertensive vascular disease should be considered a metabolic disorder in which hypertension may or may not be a prominent feature. Braun-Menedez and others consider an extrarenal factor to be responsible for maintaining the raised blood-pressure. These workers, and Ledingham, discuss the retention of sodium and water in the genesis of experimental hypertension and cardiovascular lesions, and the factors accelerating or preventing their development. Urinary steroids are discussed by Genest, who has studied the urinary excretion of aldosterone since the publication of this book and concludes that hypertension could be caused by a state of mild and chronic hyperaldosteronism. The VEM mechanism propounded by Shorr is severely criticised by Page. The effect of denervation measures is discussed by Etienne-Martin. These are only a few of the many interesting items presented in this book. In spite of much work on animals little is known about experimentally-induced hypertension and even less is known about the condition in man. The field is wide open for research. Those engaged in this problem need to have this book, which reveals the investigations being pursued by many workers in different parts of the world.

N.S.

CORRESPONDENCE : BRIEWERUBRIEK

POLIOMYELITIS VACCINE

To the Editor: We should again be grateful for space in your *Journal* to explain the present situation in regard to poliomyelitis vaccine produced in these laboratories.

There has been a considerable demand for this vaccine. The issue, as promised, was resumed in July. This issue was used to give second inoculations to those children who received their first injection last year. The amount, about 80,000 doses, which became available in August, was sufficient to vaccinate about half of the children under 6 years old for whom application had been made this year. Medical practitioners are, of course, free to decide which children of this age-group to inoculate, but this question can best be decided by taking into consideration the age incidence of paralytic poliomyelitis in their particular district. For those uncertain about this it is suggested that the youngest children of the age-group 6 months—6 years should be vaccinated first. The vaccination of the others will thus have to be deferred until more supplies become available. It is hoped that this will be in the near future.

Large amounts of the vaccine, adequate to meet the present demand, are at present under test. These tests, based on the latest regulations of the United States Public Health Service, are most rigorous and comprehensive and take from 4 to 6 months to complete. The results are then considered by a Ministerial Committee of the Union Health Department, which meets at regular intervals. If satisfied, the Committee then releases the vaccine for issue. It cannot be promised beforehand that any particular pool of vaccine will be available for issue at a specified time. However, following the practice followed in the US, Canada, and Denmark, the Committee responsible for advising the Minister of Health has recommended that the vaccine should be issued as it becomes available and that as many individuals as possible should be given at least one inoculation as soon as possible. Following this policy will mean some delay in giving the second inoculation, but it will also mean the inoculation of the greatest number within the shortest time. The delay in giving the second inoculation will *not* be detrimental to the proper development of immunity. The first effective dose of vaccine is a sensitizing dose. The effect of such an injection is not lost if the second one is delayed for 6 months or even longer. If the second dose is given 6-12 months after the first it then acts as a booster and in most children 2 suitably spaced injections are as effective as 3. However, about 20% of children without poliovirus antibodies of any type prior to inoculation do not develop them after the first inoculation. To give adequate protection to such children it is important that medical practitioners should ensure that the children in their care whose parents desire them to be vaccinated should be given a course of 3 injections spaced at appropriate intervals over about 1 year.

The need for and, if needed, the spacing of subsequent booster injections has not yet been assessed, but in time this will become clear.

We shall write to you from time to time to inform the medical profession of the latest situation in regard to poliomyelitis vaccine.

J. H. S. Gear
Director of Research

Poliomyelitis Research Foundation Laboratories
P.O. Box 1038
Johannesburg
28 August 1956

ELSIES RIVER STUDENTS' CLINIC

To the Editor: May I through the medium of your columns draw the attention of medical practitioners to the existence of the Elsies River Students' Clinic?

This clinic was founded 6 years ago by senior students, under the able chairmanship of Dr. Mark Horwitz. They felt that there were inadequate free medical facilities available to the Coloured community in Elsies River.

During the ensuing years the clinic grew steadily. Originally it only functioned on one evening a week, but soon the number of patients forced the students to operate 2 sessions per week. At present the clinic is open on Tuesday and Thursday evenings, and at each session 50-60 patients are seen.

The clinic is run by the students with the help of qualified doctors. Seven clinical-year students are responsible for examining the patients and for diagnosis and the suggested treatment is then checked by the doctors on duty. Third-year and fourth-year students are responsible for making up the drugs, applying dressings, and giving injections.

The clinic thus not only serves the Elsies River community, but also fills a long-felt want on the part of the students. Here for the first time they are able to get an insight into general practice and thus equip themselves for their future careers.

In order to run such a clinic about two general practitioners are required at each clinic-session. With our present time-table, under which each doctor attends a clinic one evening in 6-8 weeks, we need a roster of 32 general practitioners. During the past year several of our regular supporters have gone into specialist practice, and we have not been able to fill all the vacancies. We are therefore faced with a shortage of doctors.

We are now appealing to all general practitioners to consider whether they cannot help us. Without more help we shall be unable to continue all our sessions and the need is urgent. The hours are 8-11 p.m. once every 6 to 8 weeks.

If any one is interested it would be appreciated if he would kindly communicate with the undersigned, c/o Medical Residence, or telephone 5–2412, or 5–2432 during the evenings.

M. S. Gotsman
(*Student Director*)

T 45
Medical Residence
Observatory
Cape